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contents

January 2000

14 *Art Of Noise is back, and making some new waves.*

features

32 25 Giants of Keyboard Music
These outstanding keyboard artists have done their thing in unique and special ways.

32 The Long & Winding Road
High and low points in the history of *Keyboard.*

46 25 Technology Milestones
Breakthroughs in music hardware and software.

60 25 Years of Weird Gear
The stalactite organ, a tuck 'n' roll B-3, the most unusual DX7 ever made, and more.

66 The Keyboard Diaries
Memorable moments on the firing line.

72 25 Top Music Websites
Get your music online, find gear, and discover ways to make a career in music via these Internet resources.

76 25 Players We'll Miss
Masters of our trade who joined that Big Jam Session in the Sky during the past 25 years.

80 25 Years of Classic Quotes
Unforgettable statements made during the past quarter century.

82 Master Class: 25 Tips
Wide-ranging secrets — old and new — divulged by the stars.

studio sense

90 25 Ways to Stretch Your Chops
Feeling restricted, stalled, or creatively constipated? These tips will get you up and running again.

keyboard reports

98 Yamaha S80
Expandable workstation keyboard.

106 Clavia Nord Micro Modular
Virtual analog mini-synth and editor software.

112 Yamaha SW1000XG
PCI audio/MIDI card with software.

120 Roland SRV-3030
Rackmount digital reverb with optional S/PDIF I/O.

124 Short Takes
Akai Headrush E1, Antares ATR-1, Adaptec Easy CD Creator 4 Deluxe, TC Electronic M3000.

128 Sounds
Sampleheads *New York City Percussionworks,* Korg EXB-PCM sound expansion boards for Triton.

departments

4 Letters
Sequencer wars, virtual vs. true analog, missing bits, and backlash against an ad.

10 In Review
Feel the Mahavishnu Orchestra's electricity, zone out to Rob Zombie, get ecstatic with XTC, and whirl through a great new B-3 compilation.

14 411
Art Of Noise reunites, unsigned artist spotlight, Mose Allison's *Lessons in Living,* and more.
New Gear begins on page 26!

160 Workspace
Rob Hoffman shows off his bedroom studio.

columns

132 Vintage Gear by Mark Vail
Plug into Polyfusion, modular synth maker.

134 Dance Mix by Doug Beck
Putting drama into your dance record.

136 Composing by Richard Leiter
Soothe or jangle your listeners' nerves.

140 Digital Home Recording by Craig Anderton
Start the new millenium right by doing what you meant to do before but never got around to.

142 Basics by Jim Aikin
Clues to understanding digital audio buzzwords.

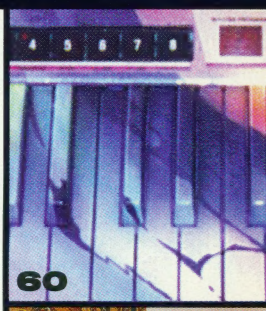
144 Reel World by Jeff Rona
Dealing with the music technologies to come.

2 From the Editor

96 *Keyboard*/Digidesign 1999/2000 Giveaway

145 Ad Index

152 Classified Ads



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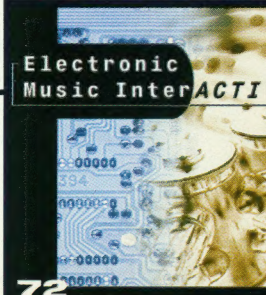

72

Roll Credits

There's More to Toast than Y2K

Hoist the bubbly. Toot the party horn. Welcome to 2000 . . . and welcome to *Keyboard* magazine's 25th anniversary year! Our official anniversary issue is September 2000, but with millennium madness in the air, we've decided to kick things off now and continue the celebration throughout the year. If you've been with us since Day One, or if you're just tuning in, we're incredibly happy to have you along. Like the scene we've been covering, *Keyboard* has been through many a twist, turn, and transformation over the past quarter-century. We've watched synths evolve from behemoth wood-paneled modulars to virtual synths that run on pint-sized laptops. We were there for the birth of MIDI, and we all nurtured it through its awkward growth spurts. We observed the rise, fall, and return of synth-based music in the mainstream. And we were among the first magazines in cyberspace as the Web began its global takeover. What a wild ride it's been, and what a bright future we're facing.

So who am I, and how did I end up in the editor's chair? Lots of luck and a load of passion for this magazine's content have brought me here. I've been a part of the *Keyboard* crew for most of the '90s, wrangling our artist features, co-writing the Dance Mix column, and reviewing a mountain of hardware and software along the way. On the side, I've been remixing my fingers off for a variety of record labels — from Reprise and London Records to cool indies like Hypnotic and Lovegroove. Now it humbles me greatly to be handed the keys to **Marvin Sanders'** office.

Speaking of Mr. Marvin, he leaves *Keyboard* in rock-solid shape — and he leaves me with a big ol' pair of shoes to fill. All of us here wish him well in his new endeavor at Riffage.com. (Be nice readers and check out the Riffage site.) Marvin was *Keyboard's* third editor, succeeding **Tom Darter** and **Dominic Milano**. Bigtime props are due to Dom and Tom, who took a fledging startup and turned it into a world-class magazine. Along the way they inspired and influenced not only the staffers who worked for them, but legions of musicians the world over. I feel very lucky to have served under Tom, Dom, and Marvin.

Regarding the current *Keyboard* staff, I'm pleased to announce a few well deserved title upgrades. **Debbie Greenberg** has risen through the ranks to executive editor, which means that the whip she cracks will now be outfitted with a sharp, shiny tip. But seriously, Deb is the unsung hero of our mag, who makes sure things get done right and on time. **Mitch Gallagher** has been promoted to senior technical editor. When it comes to gear and technology chops, Mitch is *the* man. After 12 years of loyal service, **Mark Vail** is now *Keyboard's* senior associate editor. (Sorry, Mark, this doesn't qualify you for senior discounts at the local cafeteria.) Look for the return of Mark's popular Vintage Gear column in this issue, page 132, and be sure to pick up a copy of the second edition of his *Vintage Synthesizers* paperback, due in early 2000 from MFI Books. **Markkus Rovito** does a little bit of everything for *Keyboard* — from Web mastering to feature writing to record reviewing and then some — and he does it all with the greatest of ease. His new title is assistant editor/webmaster.

The newest addition to the *Keyboard* staff is **John Krogh**, who steps into the associate editor's chair that I vacated. John is a keyboard player/programmer/producer extraordinare with a solid background in music publishing and manufacturing. Hailing from Minneapolis, he's worked for Coda Music Software and *Music & Computers* magazine, and he helped launch the *Remix* supplement for *Electronic Musician*. John just wrapped work on a major CD project for Interscope Records. Look for great things from this guy. (More about the rest of the staff in future installments.)

All for now. . . .

Greg Rule
gregrule@mfi.com

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letters

How We Stack Up

Thanks for your sequencer shootout [Nov. '99]. Very impressive research and clear comparisons. With the deepest respect for your considerable amount of work, may I point out a few subtleties?

Graphic editors aren't the only place where zooming is crucial. You also need it in notation and track overviews. I'm quite familiar with both Studio Vision Pro and Digital Performer. SVP offers a consistent zooming command set across all windows. DP, however, does not. In tracks overview, you can't use the command key equivalents available in the graphic editing windows. Worse, you can't zoom at all in DP's Quickscribe.

I think the issue for those of us who read music fluently is whether we can work nearly exclusively in a notation window. (Neither DP nor SVP has a record button on a separate staff in the notation window, for instance.) I, for one, don't necessarily need sophisticated dynamic markings so much as I need ways to display staves quickly in compositionally useful ways (just the strings, then brass and one oboe, then percussion with voice). I also need to shift notes around rapidly, both by transposing them and by moving them to different measures. Neither program handles this in a way that makes sense if you want to move quickly.

RICHARD EINHORN, via email

Mitch Gallagher did a marvelously exhaustive job comparing five of the top sequencers, a subject of immediate interest to me as a long-time user of the newly orphaned Studio Vision. However, he neglected to compare the single most overlooked criterion in any software review: stability.

I have digital audio, digital video, digital samplers, a digital board, and a digital telephone line. They're all great — when they work. Today, in a matter of a few minutes, Studio Vision crashed because I dared to use its audio "capabilities," my E-mu Ultra decided it would no longer save to the same disk it had been saving to for the past week, and my Akai S6000 — which never reliably saves its entire 256MB memory to *any* medium — froze, requiring a 20-minute reload. Then, after I painstakingly rebuilt my session, my Mackie board decided it would not put out sound on one side unless I rebooted!

My point is not that I need an uninterruptible power supply (got one, no dif) or that this is "bad" gear. In fact, it runs the gamut from usually dependable to scandalously flaky. The problem is that, with our increasing reliance on microprocessor-based instruments, the old standard of 99% reliable is no longer acceptable. I don't know anyone doing a major project using their gear to its fullest extent who doesn't have a session-stopping experience on a maddeningly regular basis.

I believe that the pro magazines, including *Keyboard,* should make reliability as important a criterion as features or price when evaluating new gear. I'm awfully tired of involuntary beta-testing. We consumers need to demand greater accountability from manufacturers on this issue. Otherwise, we face a future of design by Southworth.

MICHAEL LEVINE, via email

Michael — Mitch kept a running tally of crashes during the course of his research on the sequencers, but in the end the totals were about equal, so there was little basis for making a meaningful comparison among the programs. Keyboard *definitely reports on reliability in our product reviews, but due to the almost endless number of possible combinations, our reviewers seldom have access to the full range of gear that a given product will be required to interface with in the field.*

I really liked the software sequencer roundup. It was very comprehensive and helped me make up my mind to choose Logic. It seems those Germans really know their sequencing.

GREG CHILD, via email

I was surprised that little or no mention was made of either product vendor support or third-party support. In addition to the availability of privately operated mailing lists and user groups, vendor newsgroups such as those operated by Cakewalk are an invaluable addition to your sequencer purchase.

DAVID GREEN, via email

Great article on the audio/MIDI sequencers. One small nit: In the box on page 44 entitled "Users Groups," the Web page reached by using the URL for the Cakewalk Users Group, www.milan.net/cakewalk, was last updated in 1998! Is there a newer group anywhere?

RAY CHAPUT, via email

Ray — We aren't aware of a more current website, but there are several newsgroups on the Internet that have ongoing discussions of Cakewalk, including cakewalk.audio, cakewalk.general, and cakewalk.coffeehouse. If your ISP doesn't provide newsgroup access, you can get Web-based newsgroup access through services like www.deja.com. If you can stand a window that's cluttered with ads, go to their home page and type any of the above tags into the Search box.

Analog Rises Again

I recently picked up a copy of your magazine, and everything was . . . analog. Being an old guy who grew up on ARP, Moog, and Oberheim and never really knew any musicians who could program in FM or make their own killer samples (even though they said they did), I was encouraged that a new generation of players will be able to enjoy sculpting sounds in real time. I was so impressed that I actually visited a music store to look at these great machines. It's been a long road back.

RICHARD HUNDLEY, via email

The new virtual analogs are useful in many ways, but please refer to the photos of Jack Dangers' [vintage analog synth collection] in the same issue. Which would you honestly rather have? Sure, you have to tune and maintain an analog synth. The same goes for a Stradivarius or a Fazioli.

Rx: Take two Minimoogs and call me in the morning.

MIKE PEAKE, via email

Missing Bits

Your review of the Alesis ADAT/Edit package by Craig Anderton [Nov. '99] omitted an important issue. As a long-time studio owner who recently stepped (fell?) into the computer music world, I thought the ADAT/Edit system would fit my needs — import ADAT tracks, edit them, and return them to another tape, as advertised.

What Craig left out was that the included Emagic editing software won't work with 20-bit audio files. Sort of dumb since it's advertised to work with all ADATs. Also, there's no Emagic manual on the CD or included with the package. I finally downloaded and printed 354

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pages, only to find that half the manual is about MIDI features the card doesn't support and the other half is about editing audio files the program won't accept. I finally got through to Alesis support, and the tech told me they know it won't work with my ADAT LX-20. I returned the package to my dealer for a refund.

MARK GENSMAN, Lake Oswego, OR

Mark — Thanks for the heads-up. Craig tested numerous combinations of hardware and software, including a 20-bit ADAT and a Windows PC, but not, unfortunately, the particular combination you were dealing with. According to Stacey Moran of Alesis, "The ADAT/Edit package includes two software programs. The first, ADAT/Connect, is a transfer utility that captures, saves, and exports 16-, 20-, and 24-bit audio files. ADAT/Connect acts like a bridge, transferring digital audio from the ADAT to the computer, where it can be imported into any of the popular editing and sequencing programs. The second program, ADAT/Edit, is a customized version of Emagic MicroLogic AV. The Macintosh version of ADAT/Edit supports 16-, 20-, and 24-bit audio files (20-bit files can be opened in ADAT/Edit when saved as 24-bit files in ADAT/Connect). At present, the PC version only supports 16-bit files. If your current needs require higher resolution files, you'll need to use another digital audio program. In the near future, Alesis will release a free update of ADAT/Edit that will support 16-, 20-, and 24-bit audio on both platforms. Owners should check the Alesis website, where these free updates will be made available for download."

Software Search

I'm writing on behalf of a young blind friend who is looking for a sequencer program, not too expensive, that he can use. The display should be based on text so he can use a screen reader, and the software should be capable of being operated entirely using keyboard commands rather than a mouse. Any ideas?

KEVIN FALCONER, via email

Kevin — We're drawing a blank. What about it, readers? What about it, manufacturers? What can

NOTE FOR ALL "CREATIVE OPTIONS" FANS

After 14 years in *Keyboard*, Creative Options is taking wing as an independent website. If you'd like to keep up with Connor Freff Cochran's monthly explorations into creativity and life, you can do so at www.freff.com. You can also reach him by email (connorfc@primenet.com) or regular mail (10061 Riverside Dr. #116, Toluca Lake, CA 91602).

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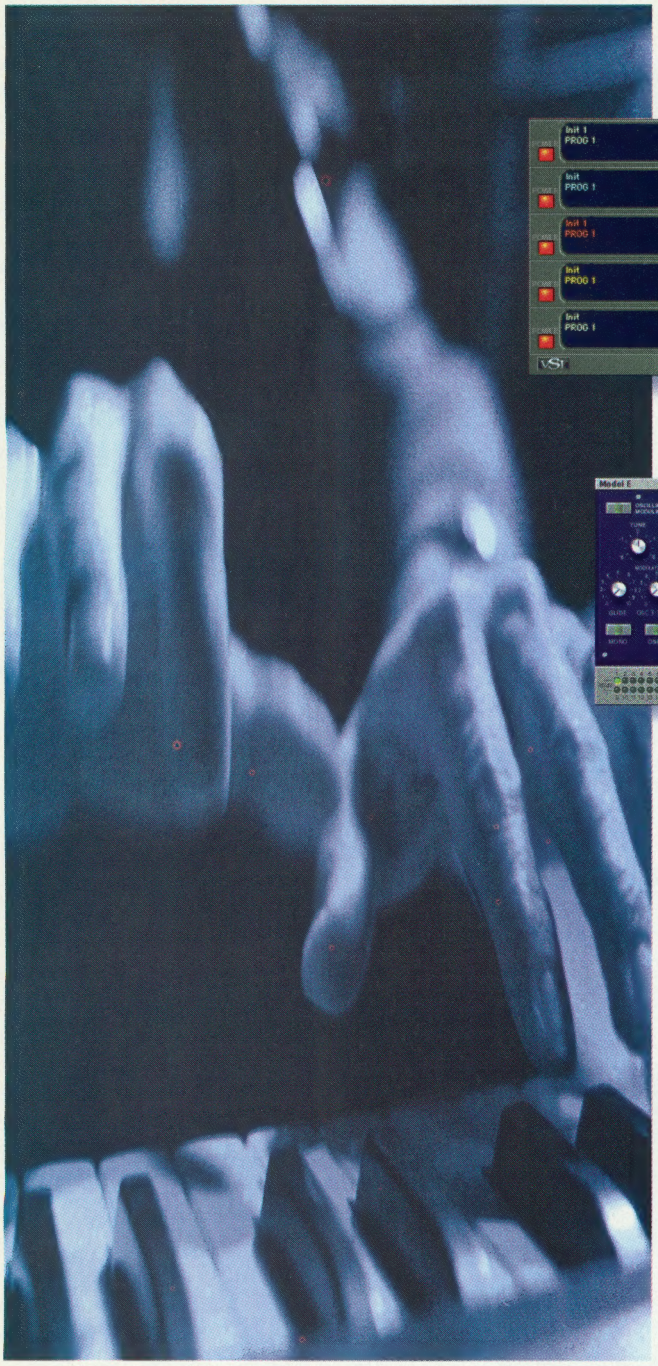

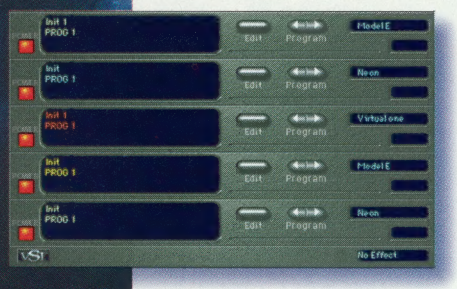

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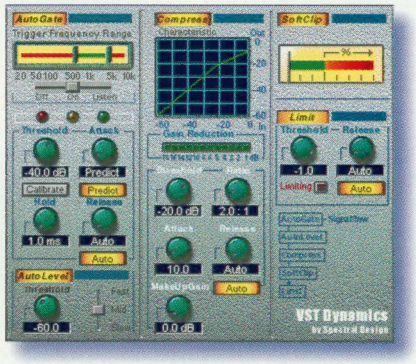

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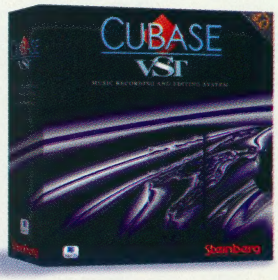

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a blind musician do to make effective use of today's computer-based music technology?

Is there any new algorithmic music software for the Mac or PC?

VAIOS ZITONOULIS, Athens, Greece

Vaios — The most powerful algorithmic software we know of for the Macintosh is Opcode Max (reviewed Apr. '91). Due to the recent turmoil at Opcode, the future of Max is an unknown at this point, but the program is very well developed and comes with excellent tutorials, so if you can find a shrinkwrapped copy, and if you have a floppy drive in which to insert the copy-protected master disk, you should have few problems. Max can also be used to process audio using David Zicarelli's MSP extensions (www.cycling74.com). On the Windows side, check out KeyKit (http://thompsonresidence.com/keykit/). Distributed independently by programmer Tim Thompson, who developed it as part of a research project at AT&T, KeyKit is downloadable. It boasts a large set of interesting and unusual MIDI processes, including interactive realtime customizable menu commands.

Sex & Drugs & Rock & Roll?

Regarding the Liquid Audio ad in your November issue, I know I'm not the first to express views about the use of drug "humor" and other degraded images by advertisers in your magazine. I spend considerable time and energy working to engender a high reputation for artists to replace this traditional "hip" view that the best artists are drug addicts or otherwise morally degraded beings. To see a magazine of high regard like *Keyboard* knowingly supporting the mongering of such images by advertisers is a bit sickening. I expect a higher level of responsibility than this from top professionals who publish a technical journal that is supposed to focus readers on what they need to be successful.

Drug abuse destroys lives and creativity. I expect your magazine to refuse to publish any form of communication which would tend to glamorize it, especially under the guise of "humor" or "hipness" such as this ad promotes.

REX PERRY, via email

Don't Be A Stranger!

Tell us your hopes, your dreams, your horror stories. It's eeeee-Z. Keyboard's *editors can be reached via email at keyboard@mfi.com and by snailmail at Keyboard Letters, 411 Borel Ave., Ste. 100, San Mateo, CA 94402, or you can steer your Web browser to* Keyboard Online *(www.keyboardonline.com) and click on "contact us."*

KEY INFO #59

KEY INFO #74

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Great harmonies used to require several band members to possess near perfect pitch, and consumed hundreds of hours of rehersal time to perfect. Thanks to the innovation from DigiTech, the Vocalist VR can effortlessly provide you with the voices necessary to live in Harmony.

VOCALIST VR

KEY INFO #23

Vocal Harmony Solutions

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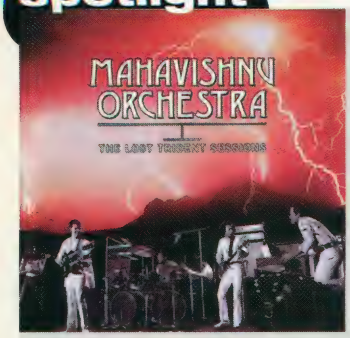
spotlight



The Mahavishnu Orchestra

The Lost Trident Sessions

As anyone who saw them live will attest, the Mahavishnu Orchestra was one of the most intense and thrilling instrumental jazz ensembles ever. Their most memorable material — *The Inner Mounting Flame*, *Birds of Fire*, *Love, Devotion, and Surrender*, and *Between Nothingness and Eternity* — were all released between 1971 and 1973. Now there's a new release to add to the list: *The Lost Trident Sessions*. The two-track tapes recorded in London's Trident Studios in the summer of '73 were rediscovered only last year. Along with a few previously unheard pieces, the tapes include "Dream" and "Trilogy" from the live *Between Nothingness and Eternity* album, but they're recorded much more clearly here. Jan Hammer gets incredible tones from and plays astoundingly on his Minimoog and Rhodes, sparring wickedly with guitarist John McLaughlin and violinist Jerry Goodman. They're backed by bassist Rick Laird and drummer/former *Keyboard* columnist Billy Cobham. M.O. was one of those super groups the likes of which may never be assembled again. MARK VAIL

(Sony Music, www.sonymusic.com)

Rob Zombie

American Made Music to Strip By

Horror meets hi-tech in this all-star remix CD. Ten of Rob Zombie's most terrifying tracks are hacked, ripped, and razored by Rammstein, Spacetruckers, Steve Duda, DJ Lethal, Praga Khan, Oliver Adams, God Lives Underwater, Poly 915, Phillip Steir, and Charlie Clouser and Chris Vrenna of Nine Inch Nails fame. There isn't a corpse track on this disc, but if I had to single out a few highlights, I'd mention Charlie Clouser's pounding breakbeat version of "Dragula," his crushing electro reworking of "Living Dead Girl," Poly 915's dunked-in-acid mix of "Demonoid Phenomenon," and the sweaty club mix of "Superbeast" by Praga Khan and Oliver Adams. If you like your electronic music served with a sharp edge, don't miss this hell-hot compilation. GREG RULE

(Geffen Records, http://geffen.com)

XTC

Apple Venus — Volume 1

A beautifully crafted, often Beatlesque pop outing that features lots of keyboard work — either by Dave Gregory, who has since left the band, or by co-producers/engineers Nick Davis and Haydn Bendall. Standouts in key work include the Mellotron flute in "Easter Theatre," the tack piano that appears throughout and brief Mellotron strings in "Frivolous Tonight," and the sampled-and-sequenced bassoon line that kicks off "Greenman." The strangely metered opener, "River of Orchids," could haunt the soul, and begs the question: Is that real orchestra or is it sequenced? No matter, it's all brilliant. MARK VAIL

(TVT Records, www.tvtrecords.com)

Stereolab

Cobra and Phases Group Play Voltage in the Milky Night

Stereolab is one of the most prolific and influential "underground" pop bands of the '90s. The current inflated prices of Moogs, Farfisas, and Vox organs are due in no small part to their popularity. *Cobra and Phases* works as a retrospective of sorts. Some songs revisit the blissful droning and repetition of their early period, others the feathery, futuristic lounge bounce of the mid-'90s. There's also a bit of the cosmic nerd funk that they explored on their previous album, *Dots and Loops*. *Cobra and Phases* may not be Stereolab's masterpiece, but it is a fitting finale to their decade. MARKKUS ROVITO

(Elektra, www.elektra.com)

Various Artists

Electric Kingdom: Episode One

Once upon a time the beat was king. Lately, too much dance music of all genres has relied on either looped beats that have been reused over and over in different tracks, or simply unoriginal drum programming. The tweakers on *Electric Kingdom* revisit the days when beats were a labor of love. All falling into the mid-tempo breakbeat category, the flavors vary from the jungle bassline of Freq Nasty's "Under Glass" to the housey piano chords of Rennie Pilgrem's "Some Place Funky." But beat junkies will mainly be concerned with the crazy style, inventive processing, and rich layering of the ever-evolving beats on this album. MARKKUS ROVITO

(Cowboy Spliff, www.smartsystems.com)

Mother Mallard's Portable Masterpiece Co.

1970-1973

To construct their electronic sound arrangements, which existed somewhere between the realms of classical minimalism and out-and-out hippie music, Mother Mallard's David Borden, Steve Drews, and Linda Fisher used two Minimoogs, three custom Moog modulars, and an RMI electronic piano to spin floating and serene textures or crank out frenetic, analog sequencer-driven pieces. The five cuts on this reissue compilation average almost 13-1/2 minutes apiece. The 12:56 "Music" starts with an old recording of the tune "Music, Music, Music," and the lyrics, "Put another nickel in, in the nickelodeon, all I want is having you and music," at which point "music" and its accompaniment are looped and progressively joined by layers of hypnotically arpeggiated and manually played lines. Very far out stuff, man. MARK VAIL

(Cuneiform Records, www.fe.org/labels/cuneiform.html)

Various Artists

Organ-ized

Not just another compilation of "heard-it-before" Hammond B-3 cuts, *Organ-ized* features a collection of all-new tracks from premiere players of the old and new guard recorded specifically for this disc. "Ashley Blue," a bluesy cooker from Joey DeFrancesco, kicks it off in a style reminiscent of his rendition of Coltrane's "Sister Sadie." Things take off from there to include New Orleans-influenced contributions from Art Neville and Galactic organist Rich Vogel, a funky hip-hop collaboration between John Medeski and DJ Logic, and Jimmy Smith's straight-ahead version of "There Will Never Be Another You." On the modern side, Minnesota native Ricky Peterson turns in the skanky "Drop Shot," which is laced with some of his signature #11 arpeggiated runs. The laid-back "Moodbird" features Larry Goldings floating in and around the tune's quartal harmonies, stabbing here and there in all the right spots. With its cross-section of styles, this disc would fit nicely into any B-3 fan's collection. JOHN KROGH

(Windham Hill, www.windhamhill.com)

Someone's Listening

ILIO is proud to introduce a new line of superb sample libraries by **Sonic Reality**. Real enough to move the most critical listener.

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All Acoustic Drum Kits with a mega multi-sampling of kicks, snares, toms, hats and cymbals, from old Ludwig®, and Gretch® sets to new top of the line Pearl®, and Drum Workshop® kits. All hits (no loops). These are extremely realistic drums that you can wack from your keyboard or with your drum pad/triggers. The hits were performed by great players like Toss Panos (Toy Matinee) and Nick D'Virgilio (Tears For Fears, Genesis). Interchangeable snare programs feature 20 to 50 hits per snare for realism from center, to edge, to rim!

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Brilliant renditions of the quintessential Yamaha piano sound. Features a Yamaha C7 recorded in-studio and a C3 nine foot grand recorded in a concert hall, both with several dynamics. We've even included pedal down notes with resonating harp. These pianos respond beautifully to 88 note weighted controllers. Each dynamic is in stereo or mono and can be loaded together or individually for maximum flexibility with your set up. You get a slew of programming options for loud or soft music and a useful variety of memory sizes ranging from 10 to 90 megs.

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Vintage Timetraveler

This disc is packed with the coolest vintage sounds from the 60s, 70s and 80s. Features 83 Organs, Distorted Leslie Organs, Vox Continental, Farfisa, Optigan, Orchestron, Mellotron, Novatron, Chamberlins, Wurlitzers®, Rhodes®, RMI, Pianet, Clavinet, Arps, Moogs, Prophets, Jupiters, PPG, OSCar, Gleeman, Modular Synths. Plus, Vibrato Fuzz Guitar Stack, Talk Box Guitar, Various Guitar FX, Ricky 4001 Bass, Fender 62 P-Bass, Hofner "Beatle" Bass, Vintage Acoustic Drum Kits, Classic Drum Machines, more.

"How often I've checked out sampled renditions of these and other famous boards, only to be utterly disappointed! Not so with Sonic Reality's "Vintage Timetraveler"... The acoustic drums and drum machine sounds absolutely kill... remarkable..."
-KEYBOARD

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American Heartland

Features acoustic six and twelve string guitars with pick, fingers and kapo, plus Mandolin, Mountain Dulcimer, Dobro, Slide, Pedal Steel, Banjo, Harmonicas, Pump Organ, Upright Bass, Tack Piano, Drums and more! This disc has lots of multi-sampled notes and chords plus some tasteful licks as well to add a little cross-country flavor to your music. Perfect for that "unplugged" sound as well as for Folk, Rock, Country, AAA, Blues, commercials, soundtracks – or wherever that old country road takes you.

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Sample the World

Opium

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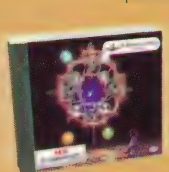
CD-ROM (includes Audio CD) $149
AKAI/Emu EOS

Ethnicity



Here's a collection of loops featuring percussion sounds from the outskirts of Asia, including India, Arabia, Turkey, Thailand, Bali, and even Australia. You won't want to miss the multitrack stereo-recorded 38 gong Gamelan orchestra, and Turkish loops you just won't find anywhere else. Includes Tablas, Tampura, Swar Mandal, Anklung, Jegogan, Kantila, Didjeridoo, Jew's Harp, Arabian and Turkish percussion. Loops and some kits.

Indian Loops, Arabian Loops, Turkish Loops, Indonesian Loops, Thai Loops, Didjeridoo, Jew's Harp

CD-ROM (includes Audio CD) $149
AKAI/Emu EOS

Mediterranean

Wonderfully recorded, authentic Mediterranean. Includes Bouzouki, Baglamas, Tzouras, Oud, Saz, Jubus, Darbuka, Tambourin, Daires and more. Features a myriad of spicy phrases (chromatically sampled), and multi-sampled instruments, plus percussion loops. This festival of flavors from Greece to Turkey will add that perfect organic seasoning to your music.

CD-ROM 2-disc set $299
Akai/Emu

Flamenco

Evoking the passion of Spain. On this exquisite two-disc set, you'll get ensemble guitar patterns and riffs in several keys, styles and tempos. Plus guitar chords and multisamples, percussive guitar slaps, male and female voices (speaking and singing) hand claps, and foot sounds. These authentic, yet fresh and sultry rhythms are at home in a variety of musical styles. Flamenco is the only way to capture the true Spanish spirit.

CD-ROM 2-disc set $299
Akai/Emu

ILIO ENTERTAINMENT

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the curious,
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and those who
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all share a common bond.

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Groove Control™.
Independent control over
tempo, pitch, pattern
and feel, on live, stereo
drum loops.

It's here. It's shipping.

Now the groove
is in *your* pocket.

Skippy's Big Bad Beats

From producer/programmer **John "Skippy" Lehmkuhl**, one of the true gurus of groove, comes an explosion of unique, hi-fi, funkified drum loops. Skippy uses his wacky imagination to create **hip hop**, **trip hop**, and **dance** grooves that come in a variety of flavors, including smaller mixes, no-kick, no-snare, and even breakdown versions! Plus, this library is entirely **Groove Control®** activated, meaning you can load any of these grooves into your sampler and have completely **independent control** over **tempo**, **pitch**, and even the **feel** of the grooves, using just your sequencer and sampler. Look for this amazing advancement, exclusively on upcoming ILIO and Spectrasonics products, to put you in charge of your groove, instead of the other way around.

Groove CONTROL ACTIVATED

Total control. Slammin' loops. Don't miss these Biggest and Baddest of Beats!

CD-Audio (without Groove Control) $99

CD-ROM (with Groove Control) $199
(Includes sampler CD-ROM and Audio/Data CD)
Roland, Akai/Emu, Kurzweil, SampleCell

ILIO

TranceFusion

Swirls, sweeps, textures and delirium! A bottomless well for remixers, electronica gurus and scorers, this disc features huge, evolving swishes and glides perfect for transitioning from one groove to the next. Tons of climbers, noise and percussion sweeps, and spectral effects ranging from 3 to 30 seconds long! You'll also get thick lasers and stabs, trippy arpeggios, unheard-of textures, lunacy and vocal madness. *"This is a product whose time has come... awesome... TranceFusion's creators certainly knew what they were doing..." –KEYBOARD 10 of 10 rating.* ***Key Buy Winner!***

CD-Audio $99

CD-ROM $199 (includes Audio CD)
Akai/Emu/Kurzweil, Roland, SampleCell

Virtuoso Strings

The Virtuoso Series Strings by Kirk Hunter is the first significant new string library to arrive in three years. Recorded in LA by top musicians, it offers a variety of articulations previously unavailable, like **grace-note slides** and **repeated notes**. Plus various **vibrato** styles, a true **Sordini**, **hard and soft attacks**, **half and whole step trills** and much more! It features Violins with 24, 8, 2 players, and solo, Violas with 16 players, Cellos with 10, 6, 2 players or solo, and Basses with 5 players. A whole new category of string library!

"These are the smoothest and most ambient sampled strings I've ever heard! The programming is really creative. I can now finally get some really expressive performances from a string sample library!"– David Newman, Academy Award Nominated Composer

CD-ROM Multi-Disc Set $995
Akai, Roland, SampleCell, Kurzweil, Emu EOS

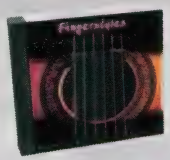
Double Platinum Drums

JAM-PACKED multi -disc set! Multi-Platinum record winners, producer **John Boylan** and drummer **Michael Botts** have put together the smartest, most tightly assembled collection of drum loops to date. Phenomenally well-recorded and mixed in true stereo with the same high quality you expect from platinum records. These acoustic kits are played with raw rockin' energy and plenty of feel. Loops and Hits. Dry and Room. Intros, Fills and Ends for complete tracks!

CD-Audio 2-disc set $129

CD-ROM multi-disc set $299
Akai/Emu, SampleCell,
Roland, Kurzweil

Fingerstyles



The most inventive and useful approach to sampling Acoustic Guitar. Fingerstyles consists of Guitar Patterns, Melodies, Cadences and Endings arranged in construction kits which can be assembled and overlaid to create complete seamless tracks. A myriad of styles is included, from New Age to Rock. Beautifully played and recorded, it's the perfect solution for composers on a schedule. You won't believe the realism!

★★★★1/2 *"The results that can be achieved using this disk are both beautiful and utterly convincing..." –SOUND ON SOUND*

CD-Audio $99

CD-ROM $199 (includes Audio CD)
Akai/Emu, Roland, Kurzweil, SampleCell

UNIVERSAL SOUND BANK

Jazzistic

Here's a set that'll jump and jive its way into your music. It's jazz with a little hip-hop on the side! These crazy loops and kits have a classic sound, featuring **Sticks** and plenty of **Brushes**. Lots of **Cymbals** too. You also get **Standup Bass** and cool **Guitar** riffs to go with the grooves. CD-ROM features extra multi-samples, **Suitcase Piano** and **Hammond**.

CD-Audio 2-disc set $129

CD-ROM 2-disc set $299
(includes 2 Audio CDs)
Akai/Emu

Carib'Bean Killers

Take an uncharted journey through Trinidad, Martinique, Haiti, Jamaica, and Cuba. Featuring the famed Fanfant Brothers rhythm section, this beautifully recorded set explores the island crannies of the new Caribbean vibe, as well as its African roots. You'll get infectious Drum, Percussion and Bass grooves, played together and broken out with solid tempo and feel. If you need to experience the pure, hi-fi essence of Soca, Reggae, Salsa, Calypso, Ragga, Zouk and Biguine, this library will get you there.

CD-Audio/CD-ROM
2-disc set $129
Akai/Emu

SPECTRASONICS

Distorted Reality 2
"Darkness & Light"

The completely new adventure in sonic dementia from producer **Eric Persing** is here at last! DR2 was created with the very latest in sonic sculpturing technology. Spinning metallic textures, singing oceans, vast amounts of unique loops (50-480 BPM!), impacts, pads, subsonic low-end and the many joys of feedback only begin to describe the wonderful noises in this collection. If you are a fan of volume 1, your sonic arsenal is simply incomplete without "Darkness & Light."

"Spectrasonics had a lot to live up to with DR2, and they didn't disappoint!" –KEYBOARD ***Awarded Key Buy!***

★★★★★ – *SOUND ON SOUND*

CD-Audio $99

CD-ROM $199
Roland, Akai/Emu, SampleCell, Kurzweil

Hans Zimmer Guitars
Volume 2

This brilliant follow-up to Volume 1 raises the bar in recording, sampling and programming techniques, perfected by veteran sound designer, Bob Daspit. These instruments feature velocity switching for both up and down slides, and an intuitive new method for controlling vibrato with dynamics. It's beautifully programmed and a thrill to play. Volume 2 features Jazz Hollowbody Guitar, Lap Steel Slide Guitar, Electric Baritone, Flamenco Nylon, and a killer new Steel String Acoustic. Plus, check out the rare Middle Eastern, South American and other world instruments like the Charango, Mandolin, Cavaquiñho, Cuatro, Oud, Saz, Electric Sitar, Cumbus, and Yayli Tambur. All are amazingly captured in this stunning new release!

★★★★★ *"... a must-have disc for anyone needing first-class plucked instrument sounds... this collection deserves all five stars." – SOUND ON SOUND*

CD-Audio $ 99
CD-ROM $299
Roland, Akai/Emu, Kurzweil, SampleCell

Bizarre Guitar

Sound designer **Eric Persing** and guitarist **Peter Maunu** blaze a new trail of sound design via guitar. It features the extreme contrasts of breathtakingly beautiful **ambience beds** and **searing harmonic slashes**, **bowed guitar**, **strange funk** and **unsettling washes**. Created with tape loop techniques, e-bow, the Roland VG-8, and cutting edge signal processing tricks, you won't believe your ears. The CD-ROM version includes selected Groove Control™ loops.

"...The range of sonic ideas is vast...brings to mind the dreamlike soundscapes of Fripp and Eno...an aural addict's dream come true." – KEYBOARD

"...meticulous attention to detail... perfectly suited to ambient and film music...Bizarre Guitar will appeal to those who like Distorted Reality, providing a wealth of strange and beautiful sounds." – SOUND ON SOUND

CD-Audio $99

CD-ROM $199
Includes sampler CD-ROM and Audio/Data CD
Roland, Akai/Emu, Kurzweil, SampleCell

Retro Funk

Make it funky! The first title in the new **Classic Drumming Series** from Spectrasonics is a booty shakin' blast to the past! Thrill to the Lo-Fi sounds of the 70's. It's a whole history of Funk grooves, from Fatback/Old School/ P-Funk throwdowns, to the Go-Go scene, to swingin' Boogaloo, to the intricate James Brown/Tower of Power approach, and everything in between.

Vintage mics, Analog Tape compression and antique drums all contribute to the funky mess. They work great in many modern contexts, and are the source of the Hip-Hop, Acid Jazz, Jungle and Drum 'N Bass movements.

Intros, Fills, Breakdowns are provided along with separate Claps, Cymbals and funky live percussion loops too!

CD-Audio (*without* Groove Control™) $99

CD-ROM (*with* Groove Control) $199
Includes sampler CD-ROM and Audio/Data CD
Roland, Akai/Emu, Kurzweil, SampleCell

Burning Grooves

Finally, a drum library that delivers maximum impact. Killer kits & blazing live grooves laid down by L.A. flame-thrower **Abe Laboriel Jr.** (k.d. Lang, Seal, Jeff Beck), with creative re-mixes by producer Eric Persing. If you're looking for attitude, search no further!

★★★★★ *"A slammin' combination of drum kits & loops... Sizzling cymbals & punchy drums... Expressive & realistic kits... killer beats... rock-solid playing... Excellent." –KEYBOARD*

"The quality of both the playing & recording is first class... Impressive!" –SOUND ON SOUND

★★★★★ *–ELECTRONIC MUSICIAN*

CD-Audio $99 (grooves only)

CD-ROM $199
(grooves and kits)
Roland, Akai/Emu, Kurzweil, SampleCell

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Now, more "liquid" than ever! The unique and inspiring grooves from the timeless library "Liquid Grooves" are now available in a Groove Control™ version. This revolutionary new method allows you to mix and match grooves in any tempo, and will follow tempo changes from your sequencer! Groove Control also allows you to change the pattern, feel and pitch of the rhythms to your music. Imagine being able to tune the Wavedrum™ grooves to the key of your song in real-time, without changing the rhythm! Program your own original patterns and fills with the same sounds and mixes from this library!

Existing Liquid Grooves CD-ROM users can upgrade to the new Groove Control version.

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CD-ROM (*with* Groove Control) $199
Includes sampler CD-ROM and Data CD
Roland, Akai/Emu, Kurzweil, SampleCell

Call about our special Upgrade price!

Bass Legends

Marcus Miller, John Patitucci & Abraham Laboriel present their coveted electric and acoustic basses & grooves on this critically-acclaimed 650 meg collection.

TRIPLE ★★★★★ review "...a truckload of great multisampled basses ... Definitely put this one on your list of must-haves!" –KEYBOARD

"... superb... well organized, exquisitely recorded, and brilliantly performed." –ELECTRONIC MUSICIAN

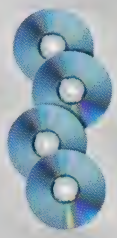
CD-Audio $99 (grooves only)

CD-ROM $299 (basses and grooves)
Roland, Akai/Emu, SampleCell, Kurzweil

Symphony of Voices

A massive FOUR CD-ROM SET, which includes a variety of multisamples, phrases & fx from some of the world's most prestigious singers.

- **The London Chorale.** 80 voice choir with multisamples and fx
- **English Boys' Choir.** solo and ensemble multisamples and phrases
- **Classical Soloists** Operatic tenor and soprano phrases and expressive multisamples of each soloist
- **Gregorian Men's Choir** Multisamples and ancient Chants
- **Lush Multitracked Pop Stacks** "Enya-esque" pads



"... simply stunning... without a doubt the ultimate library of choral samples." –KEYBOARD 10 of 10 rating. ***Awarded Key Buy.***

★★★★★ *"... the definitive vocal sampling work." –SOUND ON SOUND*

CD-ROM $499 4-disc set
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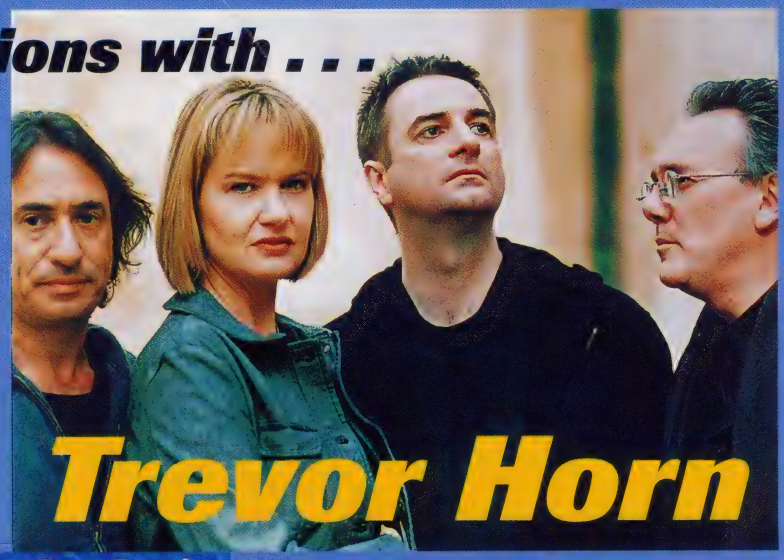
- Multiband master stereo limiter
- Physical modeling with true tube emulation
- High quality, real time preview and processing
- 32 bit floating point resolution
- Analog, easy to use interface
- Fade-in/fade-out/song markers
- Snapshots and presets
- Mac/PC, supports WAV, AIFF, SDII
- Compatible with all popular audio cards (Digital I/O suggested for even better quality)

"It's impressive to find a digital program that does such a good job of providing analog warmth and punch. A very well thought out product." – Ric Wilson, Grammy winning mastering engineer.

"Not only the best digital compressor I've ever used, but one of the best compressors period! The Stereo Enhancement is outstanding. The real strength of this product is how musical it is." – Eric Persing, Sound Designer, Spectrasonics

5 Questions with . . .



On his own, Trevor Horn has amassed an exhaustive and impressive collection of credits. His production skills are among the best in the business, but Trevor also rocked our world as a member of the seminal '80s synth band Art Of Noise.

Imagine our surprise when a new Art Of Noise CD arrived late last year (nearly 15 years since their last effort) along with word of a world tour. The latest incarnation of AON teams Trevor Horn with fellow founding members Anne Dudley and Paul Morley. JJ Jeczalik and Gary Langan weren't onboard for this go-around, but Trevor invited friend Lol Creme (of 10CC and Godley & Creme fame) to contribute to the album and tour. And what an album it is: Classical piano meets drum 'n' bass. It's a marriage made in high-tech heaven.

We rolled tape with Trevor during the western U.S. leg of the band's tour.

1. How did Art Of Noise reunite? I suppose it started when I phoned Anne [Dudley], back when I was doing Seal's first record around 1991. I needed to get the best string arranger I possibly could get, and Anne is the best. I hadn't worked with her in seven years, so I phoned and we started working together again. Anne is very fond of musical puzzles — you know, how do you get from this key to that key without it being obvious, or whatever. We had such fun that we started to talk about this idea of working with Debussy's very early piano pieces.

2. How did you see the music of Debussy blending with modern electronic styles? At some point I pointed out to Anne that drum 'n' bass music ran at 160 bpm and most of Debussy's piano pieces were at 80 bpm, so you could play at half speed over a drum 'n' bass rhythm. We tried it, and it got us excited, so we started to work on this record. Then we thought, "If we're going to do this together, why not call ourselves Art Of Noise again?" That's really what it was, so it stemmed from there.

3. From conception to completion, the project took nearly a decade. Why so long? Lots of things happened, and we did it in lots of different ways. Starting out, Anne had to practice a bit, because she hadn't played a lot of these pieces before. So then we'd get together for a week and record the pieces as they were actually written. The only unusual thing was that we used [Digidesign] Pro Tools and [Emagic] Logic to record the MIDI from the piano at the same time we recorded the audio. And then we'd sort of do things remotely. Anne would chop things up and send them to me. Meanwhile I was wandering around the world with a Mac Powerbook running Pro Tools. I did an enormous amount of work on that system. So things would go back and forth, and then occasionally we'd get together for a few days.

4. There's no shortage of excellent drum 'n' bass programming on this record. How did you do it? One of my approaches was to hire the best guy in England [*laughs*], a guy called Paul Waller. But basically I'd take a great breakbeat, speed it up, and chew it into pieces. You can [Steinberg] ReCycle it, but I tend to use Pro Tools a lot, because I can be incredibly accurate with it. ReCycle is good, but I can do exactly what I want in Pro Tools.

5. How are you re-creating this music for the live show? We're taking a whole Pro Tools system with us on the road. We don't have a drummer; basically the computer [a 400MHz G3] is the drummer, but we're running the drum tracks through a set of filter banks [Sherman Filterbanks and assorted TDM filter plug-ins]. We figured it was the most practical way to go for this first tour. We're on a limited budget, and touring is incredibly expensive. So the computer is being operated by Tim Weidner, who did engineering on the album. I'm playing bass, Anne's playing keyboards, Lol's playing guitar. . . . Anne's just using one master keyboard, and we have two [E-mu] E4s with everything in them. GREG RULE

spin this

Fans of the **Beastie Boys** are in for a big-time treat with *The Sounds of Science* — a two-CD anthology that spans the Beastie Boys' platinum career. The big hits are included, along with a batch of rare and unreleased material, including "Skills to Pay The Bills," the original version of "Jimmy James," and gems from the never-released Country Mike sessions. The Sounds of Science also includes one new track, "Alive." [Source: CDnow Allstar News, www.cdnow.com] . . . Congrats to **Santana** (and keyboardist **Chester Thompson**) for hitting #1 on the *Billboard* album charts. *Supernatural* (Arista Records) is driven by the smash hit "Smooth," which features the guest vocals of **Matchbox 20's Rob Thomas**. He's just one of many guest celebs on the CD. Also appearing are **Lauryn Hill**, **Eric Clapton**, **Dave Matthews**, **Everlast**, **Wyclef Jean**, **Eagle Eye Cherry**, **Mana**, **KC Porter**, the **Dust Brothers**, and others.

Photo by Valerie Phillips

online

Caught in the Web

Online auctions, news, and a buck or two

www.musichotbid.com Musichotbid.com is a new online auction site specializing in music-related items. Categories cover everything from pro audio to books and videos to records and CDs to stringed instruments.

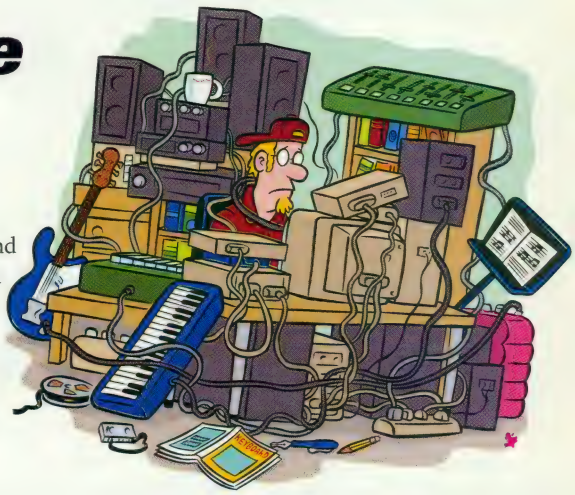
www.musiciansfriend.com Looking for a way to make some bucks with your Web site? The Musician's Friend Web site affiliate program will pay you a 10% cash referral fee for every sale originated through a link on your site.

www.audiotoday.com A daily news site that provides information on music industry happenings, especially as related to online music. In addition to news, editorials, and feature stories, AudioToday is developing a line-up of related audio programs in conjunction with The Green Witch Internet Radio. The first of these, "Wireside Chats," is a talk show that has featured a number of Internet music leaders.

business

Stand in the Place Where You Work

Ergonomics for the home studio



A Guest Room Warrior rides tirelessly in the saddle . . . a romantic way of saying that we spend a lot of time sitting on our butts in front of keyboards and computers. Most of us build our studios one piece at a time, usually fitting new stuff in wherever it will go. The result is often a jungle of gear and wires, and a set of personal calisthenics required to get at the stuff.

You can work more efficiently and with less fatigue if you create a plan for your room. My old studio was the standard pile of cables and hard-to-reach places. When we moved into our new space, we carefully planned the layout for maximum effectiveness. The difference in productivity and pleasure is truly amazing. Try this:

1. **Make a planning kit.** Measure everything in your room and draw floor plans. Then draw scale, top-down drawings of your gear and furniture and cut them out so you can move them around on the floor plan. Think it sounds like grade school? It's a *lot* easier to make paper cutouts and move them on paper than it is to pick up the real stuff and move it. There's computer software for this purpose, too, if you really want to go all-out.
2. **Make drawings of your racks.** Planning where things sit in the rack can make a huge difference in your daily work. Put gear that needs regular front-panel adjustment in easy reach, and things that are set-and-forget down low or up high.
3. **Visualize yourself in the new space.** When your plan starts coming together, stop and think. It might look good on paper, but will it *work*? Make elevation drawings if you can, and imagine yourself working in the studio. Can you really reach that DAT machine from your chair? Will your speakers really fit by that computer monitor?
4. **Take a cable inventory.** You've probably got at least a couple of things in your room that sit in their current position because that's how long the cable was. Throw off cable tyranny! Invest some money in new cables, or invest time in making them.

Now pick a day or two when you can afford to have your studio disabled. Unplug everything, move it, re-rack it, and plug it back in, doing some cable management as you go. If you've done your planning, your new space will look, feel, and *work* better than ever. JIM BORDNER

Illustrations by David Coulson

backstage pass

BAND: Jethro Tull

Keyboardist: Andrew Giddings

A "B" or not a "B"? Andrew Giddings blows the lid on his imposter B-3 rig. Inside the wood cabinet is a pair of Roland D-70s.

When bands have been around for over three decades, they tend to have a revolving door policy when it comes to personnel. Jethro Tull is no exception, as today only one member remains from the original line-up: singer/songwriter/flautist Ian Anderson. Over the years they've had two guitarists, six bassists, five drummers, and seven keyboardists; their distinguished alumni include John Evans, Eddie Jobson, Don Airey, and Peter-John Vettese. The current keyboardist is Andrew Giddings, who has been with the band for nine years.

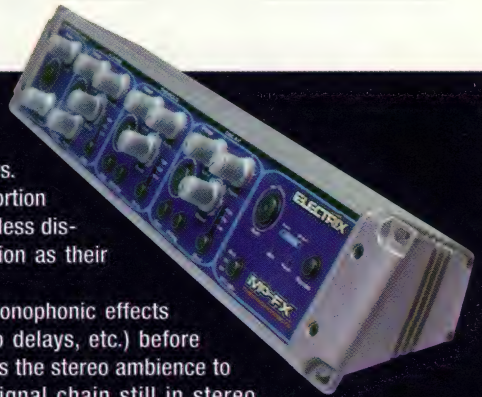
Since joining Tull, Andrew has developed strong feelings about interpreting classic material. "In my opinion, when people go to a concert to hear the music they like, they don't want to hear it messed with. So where possible, I'll learn stuff note for note. I never get fed up with playing the same stuff, because it's not the kind of music where your mind can wander. You have to concentrate 100 percent all the way through. It's great music to play."

Giddings describes his Tull road rig as "a very simple setup and comparatively low-tech, but it's doing a hell of a lot of stuff." Onstage he uses a pair of Roland D-70 synths as his controllers (and to generate sounds); both are housed in a remarkable imitation of a Hammond organ. The replica was Anderson's idea, because he felt modern synths looked out of place on a Tull stage. The organ look-alike received a nice compliment from Keith Emerson, who asked, "Which model Hammond is that you're playing?" Giddings' controllers are MIDIed to a Roland S-760 sampler, which holds a variety of sounds, including backing vocals, flutes, and orchestral samples. He also uses a Hammond XM-1 drawbar module. Two stereo feeds are sent to the house from his Mackie CR1604 mixer.

Giddings appears on Tull's latest release *Dot Com*, and has the honor of being their first keyboardist to have an unaccompanied solo song, "Nothing @ All." He wrote and recorded the track, which he describes as a "piano doodle," at home using Steinberg Cubase VST. The album is a welcome return to form for this band, and the keyboards have a more prominent role than they've had in years. Andrew also worked closely with Anderson on the flautist's new solo album *The Secret Language of Birds,* which is scheduled to be released in February 2000. TIM MORSE

sound design by Daniel Fisher

synth tricks | *The Order of Effects*



Don't worry, the "Order of Effects" is not some nerdy organization for audio geeks, it's just another aspect of getting the most interesting sounds from your processors. On this subject you'll often find that guitar players have far more real-world experience than keyboard players when it comes to experimenting with the order of their effects chain, due to their easy-to-swap stomp boxes. But with today's advanced synthesizers and powerful external signal processors, you may find that you too have the opportunity to decide the order of your software-based effects.

Here are some ideas to consider, but please remember that there are no rules with effects. Feel free to do the exact opposite of these suggestions:

◆ Try putting effects that sweep (such as choruses, flangers, phase shifters, wahs, etc.) before your delay and reverb effects. This will add a more scintillating effect, as each layer of echo will have a different degree of sweep effect. If you put the sweep effect after the delay and reverb, the sweep will be the same for all the echoes.

◆ Experiment with various effects before and after any distortion effects. Sweeping effects prior to distortion will cause the distortion quality to modulate in interesting ways. Delay effects prior to distortion result in echoes that get less distorted with each reiteration as their level drops.

◆ When possible, put monophonic effects (distortions, wahs, mono delays, etc.) before stereo effects. This allows the stereo ambience to get to the end of the signal chain still in stereo. Sometimes, feeding a stereo effect into a mono effect causes unwanted comb-filtering artifacts.

◆ If your processor allows parallel signal paths, experiment with combining a grungy effects chain with a cleaner, gently processed effects chain. You can achieve tremendous expressive possibilities if you assign a controller to sweep between the grungy and clean signal paths.

And finally, try anything and everything. Effects experimentation is an easy way to break free of your usual sonic palette.

Andrew Giddings photos by Lissa Wales

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Since we introduced the MX-2424 hard disk recorder, there has been a lot of speculation about its price (which is so low it seems too good to be true).

So we get questions. Like...

"24 tracks is an upgrade?" (No, it's 24 tracks right out of the box.)

"24-bits is an upgrade?" (No, all the bits are there too.)

"Do I have to pay extra for inputs and outputs?" (No. At $3,999 estimated street price* you get a full set of 24 TDIF-1 *or* ADAT® optical digital inputs and outputs — plus an assignable stereo AES/ EBU - S/PDIF pair. For a little more you can get 24 channels of AES/EBU digital I/O, or analog — or both digital and analog!)

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✔ Available Input/Output modules include TDIF-1, AES/EBU, ADAT optical, and analog.

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keyboard of the month

It isn't a keyboard, but this monster road rig from Mike Goins deserves a Keyboard of the Month spotlight. "I got tired of disassembling and reassembling the gear for live gigs," he writes, "so over time, I moved to rackmounted gear and one controller keyboard. To carry the rackmounted gear, I built this road case complete with lid. It measures 61" x 32" x 17", which, not by chance, fits in the trunk of my car. There are handles on each end, and even wheels for rolling. Friends tell me it looks like a music store display." For more info, visit Mike's Odyssey Productions website at www.jacksonville.net/~odyssey/index.htm.

Do you have an unusual keyboard or rig? Send photos and details to John Krogh c/o *Keyboard*, 411 Borel Ave., Ste. 100, San Mateo, CA 94402, or email jkrogh@mfi.com.

KEYBOARD & RIFFAGE.COM

Unsigned Artist of the Month

KRYSTALJOCK

When *Keyboard* discontinued the Discoveries column a year or so ago, we were quickly inundated with calls and emails from readers who wanted to know how unsigned artists could get mentioned in our pages. "Stay tuned," we urged. "We may launch a new 'unsigned artist' column or section in the future."

That day has finally come. Welcome to the first installment of "Unsigned Artist of the Month" — a new monthly feature that spotlights a deserving, unsigned keyboard-based artist. Each month, the folks at Riffage.com will select ten artists from their expansive talent site, burn a CD with a track from each artist, and forward the disc to *Keyboard*. From there, we'll narrow it down to one winner. All styles will be welcome. (Info on how to join the Riffage community below.)

Here's our first winner: Martin "Krystaljock" Siversten from Norway. "A one-man venture into the realms of tweekin' house and techno," says his bio, "Krystaljock is the product of a deranged Norwegian with an incomparable capability for pulling all-nighters with his few pieces of equipment."

We're not sure how much or little Krystaljock used to make the track "Combust," but it doesn't matter. This track kicks ass — a house-meets-trance barn burner. The rhythm programming isn't overly sophisticated, but it's rock-solid. The transitions, breakdowns, and filterswept build-ups deliver maximum impact. The percolating synth arpeggios and bass lines have energy galore, and the vocal sample "It could explode" works well as a hook/gimmick.

What this track doesn't have is a melodic hook or verse/chorus-type arrangement. It's a hypnotic club track by design, and on that level it succeeds. Great synth work and programming, Martin.

Log onto www.keyboardonline.com to hear the Krystaljock "Combust." GREG RULE

Riffage.com showcases new music, allowing fans to share playlists of their favorite tunes. Artists can sell MP3s and CDs, post their gig schedule, maintain a photo gallery and more — all for free. Check it out at www.riffage.com.

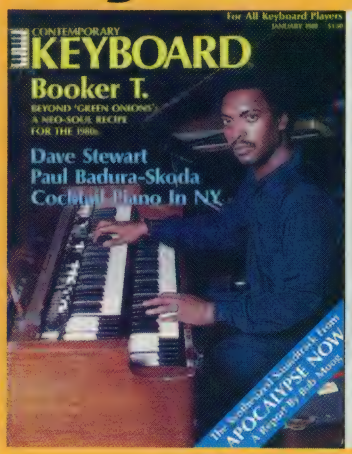
VITAL STATS

Genre: Electronic/techno, house, drum 'n' bass
Band Members: Martin Sivertsen, composer and producer
City: Trondheim, Norway
Musical Influences: Hardfloor, Daft Punk, Chemical Brothers, Orbital, Prodigy, Roni Size, Fatboy Slim
Background/History: '76er from Norway, currently living in Sydney, Australia
Home Page: http://krystaljock.hypermart.net

DEPARTURES

Pianist/composer **Manfredo Fest**, who shaped the bossa nova movement along with such Brazilian compatriots as Joao Gilberto and Antonio Carlos Jobim, died on Oct. 8, 1999, at the age of 63 in Palm Harbor, Florida. He had been waiting to receive a liver transplant. Fest played an intricately arranged style of bossa nova that was strongly influenced by bebop. It had a distinctively Brazilian style that would leave an indelible mark on jazz and popular music as a whole. "We started incorporating those ideas into Brazilian rhythms, so bossa nova could be defined as the modern version of the samba, with jazz elements and improvisation and with the Brazilian grooves and syncopation," said Fest in his Concord Records biography. Fest's first American album was *Jungle Cat*, released in 1978 on the DMP label. After a series of albums for DMP and one for Tabu, he signed with Concord Records, on which he released the albums *Oferenda, Comecar De Novo, Fascinating Rhythm,* and *Amazonas*. [Source: CDnow Allstar News, www.cdnow.com]

20 years ago today



The legendary Booker T. (of "Green Onions" fame) appeared on our January 1980 cover. When asked about his early years learning the B-3, getting accustomed to playing the bass pedals, Booker told *Keyboard*, "It was easy. You learn them just like you learn the regular notes. I took my shoes off, and she [Booker's second grade music teacher] taught me how to feel with the heel and toe method. You usually play the black notes with the toe, and the white ones are usually played with the heel. I use both feet on the pedals; it's just like walking." On the back cover of that issue was a Rhodes "flat top" ad. Wow, look at that stack!

cool tools

Wipe Out! CD Repair Kit

Just scratching the surface

Can there be a worse feeling than the one you get in the pit of your stomach when you realize you've scratched a precious CD to the point where it will no longer play? It's not so bad if you've scratched a commercial music CD; $15 and you're back in business. But what if you've scratched your only copy of a discontinued piece of software or a CD-R containing archives of your music?

Several companies offer fixes for scratched CDs that work to one extent or another. Joining the fray is Esprit Development Corporation with their Wipe Out! CD Repair Kit. The kit consists of a polishing cloth and a 3/4 oz. bottle of Wipe Out! solution. The solution contains a combination of plastic softeners, micro-abrasives, and a hard wax in liquid form. The idea is that you apply a drop of solution to the scratch, then polish it out using the cloth — simple enough. As long as the scratch doesn't reach through to the aluminum bit plane sandwiched inside the CD, it should be repairable.

So does it work? I tested Wipe Out! on an audio CD as well as on a CD-R. I scratched both discs using the point of a sharp pair of scissors. The scratches were deeper and wider than any I've encountered in my own CDs — neither would play at all. I'm happy to report that an hour or so (and some elbow grease) later, both CDs played perfectly. The abrasives do leave behind a haze of tiny scratches, so the disc won't be quite restored to its original luster. But that haze doesn't seem to affect playback.

At $14.95 plus shipping, Wipe Out! isn't super-cheap (the company says a bottle will repair up to 40 discs), but it's a small price to pay to recover an irreplaceable CD or CD-R. Contact Esprit Development at 908-284-0426 or on the Web at www.cdrepair.com. MITCH GALLAGHER

KEYQUESTIONS

"Can you recommend any shareware/freeware programs that can convert MP3 audio files into PC WAV file format?" Michael Carter

There are a number of freeware and shareware programs out there that can do the job for you. On the Mac, one choice is Norman Franke's SoundApp (freeware, www-cs-students.stanford.edu/~franke/soundapp). For Windows, you might try FMJ Software's Awave (shareware, www.fmjsoft.com). Shareware.com (www.shareware.com) and the Shareware Music Machine (www.hitsquad.com/smm) are two good sources for shareware and freeware programs.

"I bought my first CD player in 1992; it had a 16-bit D/A converter. Not long after that, I began seeing CD players that boasted 1-bit DACs. I've been puzzled ever since, and have never been able to get information on the differences. Craig Anderton's Digital Home Recording column in the Sept. '99 issue called this to my attention again when he stressed the importance of bit resolution. Would somebody explain this to me, please?" Gregory Dreslinski

The 1-bit process uses an extremely high clock frequency, and the bit basically describes whether the signal is rising or falling. The output is reconstructed from this. Because of the high clock frequency, smoothing filters are much simpler than those needed for lower clock frequencies, which often results in a better sound.

Early delay lines from Deltalab used a similar process. The technique was particularly relevant back then because it used less RAM than systems with longer word lengths, and RAM was very expensive.

Today, studio multitrack recording, mixing, and mastering devices generally don't use 1-bit converters, but instead the more traditional D/A converter with 8-, 16-, 20-, or 24-bit word lengths. The more bits, the higher the resolution, because the signal's level can be measured with greater precision. CRAIG ANDERTON

musicmakers

The Boss

Keyboard took in a **Bruce Springsteen** and the reunited **E Street Band** show as they rock-and-rolled through Northern California last October. **Roy Bittan** and **Danny Federici** provided a double dose of keyboard magic, as the band delivered a marathon three-hour set that was heavy on the energy and passion so typical of a Springsteen performance. Well worth the decade-long wait. Check out www.bruce-springsteen.net for more information on the band and tour. DEBBIE GREENBERG

KEYTRACKS

Album: Mose Allison, *Lessons in Living* (Discovery)
Keyboards: Mose Allison

The Montreaux Jazz Festival has produced some classic recordings, and this Mose Allison set from 1982 is no exception. The rather odd lineup includes Cream's Jack Bruce on bass, Stuff guitarist Eric Gale, the amazing Billy Cobham on drums, and elder saxman Lou Donaldson backing Mose's hip piano. As diverse as this band is, the sound is a sweet gel of swinging grooves. The group starts off as a trio with Percy Mayfield's "Lost Mind." Allison puts his peanut-butter-smooth voice to work, and you can hear him singing along with his piano riffs as he plays. He does this throughout the album, setting another terrific example of how vocalizing the melody can enhance your playing. Although he's known as a low-key jazzer, Allison can get crazy when he wants to. "Wild Man on the Loose" appropriately starts off with a manic piano line and works into an equally intense solo that colors outside of the lines. Cobham's drums keep the music firing, and he provides a perfect accompaniment to Allison's excursions.

"Your Mind Is on Vacation" is a 12-bar blues that makes the most of Mose's New Orleans-flavored rhythms, right into a two-handed solo that relies on his rhythm chops more than scale runs. Mose scats his way into a shredding version of Willy Dixon's "Seventh Son," one of the album's highlights. His solo runs into a polyrythmic pounding that climbs chromatically into near chaos, with Bruce running the bass everywhere over Cobham's erratic ride patterns — a superb rhythm section for Allison's unique style. The audience lets them know just how cool it is! After Gale comes out for "I Don't Worry About a Thing," Mose drops a wonderful solo that develops from two-handed harmonic runs into Monk-style percussive flourishes and Cecil Taylor-ish eruptions, then back into the smooth melody. It would take a much larger forum to dissect Allison's style; suffice it to say, it's truly original. The last song, the Allman-ish "Night Club," is a straight blues that really swings, giving him a chance to work out some hip melodic looping. This record smokes!

Also recommended: *Seventh Son, Middle Class White Boy.* ROBBIE GENNET

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DPS12 VERSION 2
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THE LARGEST SELECTION OF SOUNDS FOR

Visionary producer Bill Laswell (Miles Davis, Bob Marley, Sly+Robbie) stokes the dub fires with an awesome collection of dub construction kits. Massive beats, wicked bass lines and FX are in order. Tracks that filter in ambience, reggae, hip hop, jazz, dirt, grit and blood and filter out what's not. The Dub Tactic Manual contains all the ingredience you need to give your tracks a feel and groove of which there is no cure. (ID#1046)

For ambitious Easy listening producers and producers of Trip hop, Drum'n'bass and Futurejazz music. Think Austin Powers meets James Bond! Shopping mall musak, elevators, TV soaps and B movies of the 60's/70's. Bossa Nova, Latin and Brasillian styles, Jazzy Licks, Drum loops, Easy vocals, Organ, Brass attacks, Orchestral arrangements, Gtrs, Acoustic Bass, Good vibes, Old beatboxes, Rhodes & Piano phrases. (ID#1047)

The long awaited sequel to Killer Horns 1. Now experience the sound and feel of standing in front of some of the best horn players in the world, playing licks, stabs, chords, falls, harmonies and runs. Killer Horns 2 includes sections of tenor sax, baritone, soprano, flugelhorn and trumpet in various combinations. Unlike Killer Horns 1 this volume provides you with licks in different keys and tempi for maximum flexability. (ID#1048)

Using picks, mallets, screws or nails, pieces of rubber, motor-driven cog wheels or his bare hands Peter Siedlaczek has gotten sounds out of a Grand Piano, that can be found nowhere else! Many playable effects, atmospheres and percussive sounds are included (e.g. thumb tack piano). Of course, traditional pianos are also provided. 2 CD-ROM set $199.95. Available for Akai S1000/S5-6000, Emu EOS and Giga. (ID#1038)

Another stunning collection from top UK sound developer Zero-G, Freak Beats features dark and brooding beats to vibe to. The collection covers a lot of ground from Electro to Trip Hop, slow groovers to percussion lunacy. Everything is tempo matched and grouped for convenience, sliced and diced for absolute compatibility with all software sequencers... We know you'll just freak out when you hear Freak Beats! (ID#1050)

A new series for Latin producers. Festa Latina Vol.1 is a 2-CD set (Audio/WAV)that features Drums & Rhythms:. Authentic drum and percussion grooves from Latin America e.g. salsa (son montuno, mambo, guajira, guaracha, mozambique), samba (samba-raggae, batucada, bossanova), merengue, candombe, murga, bomba. Use the grooves as is or combine them with the instruments from Vol. 2 and 3. (ID#1052)

A new series for Latin producers. Festa Latina Vol.2 is a 2-CD set (Audio/WAV)that features Bass, Guitars, Keyboards: The most comprehensive collection of traditional and pop-latin pianos and bass loops, most in 4-bar rhythm, each in four keys and different tempi. A feature of this CD is the way the guitars are prepared. Their construction enables easy combinations with the other instruments. Unequalled feel! (ID# 1053)

A new series for Latin producers. Festa Latina Vol.3 is a 2-CD set (Audio/WAV)that features Brass: Latin brass at its best! Outstanding sections and solo instruments in four keys and different tempi. A must for every Latin Music producer! Also perfect for pop and other productions. The additional WAV files in this series enables you to arrange tracks fast with your seqencer. Listen to the demo on Samplemania 6! (ID#1054)

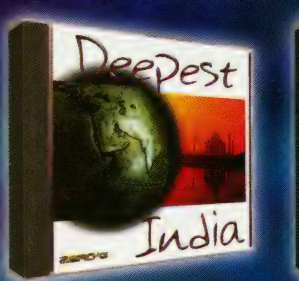
ORIENTAL PERCUSSION GROOVES: Darbuka, Daire, Percussion Tutti, Davul, Bongo. PLUGGED INSTRUMENTS: Pt. Tanbur, Pt. Emrekan, Pt. Saz, Bagl, Oriental String Licks and Phrases. ORIENTAL WOODWINDS: Reeds Kaval, Reeds Ney Taksim, Emre Clarinet and Emre Flute. MALE & FEMALE VOCALS: Voice, Choir, Ottaman Song O#. TURKISH AMBIENCES: Cassette and Black Market, Teahouse, Byzantine Cistern. (ID#1055)

From top German sound developer Ueberschall, Big Beat features 1300 of the fattest big beats, loops & samples, pushed to the max!!! You get blasting drumloops, FX atmospheres, breaks, percussion loops, radio and vinyl cuts, vocal madness, horns, axes, heavy basses, piano, rhodes, organ, synths, analog machines, hitchin' sounds. Big Beats is 77+ minutes of distorted, live, animated and underground madness. (ID#1049)

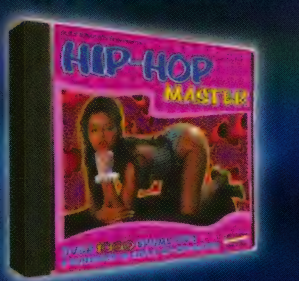
Our biggest selling product, ILL JOINTZ is 2 CDs of Hip-hop and R'n'B loops - the cutting edge of street flava all here for your sampling pleasure! Over 21/2 hours of construction kit style loops, with all loops broken down into their basic elements! All loops are at least 4 bars long so you can feel the flow, cut them up and combine them into all new combinations. Everything you need to produce a chart-topping record (ID# 1004)

Black Butta 2 features phat, head bobbing dope beatz, hip hop and R&B loops, plus breakdowns of the loop components from programmer Madjef whose credits include Janet Jackson, Michael Jackson, Boyz II Men, and producers Jam and Lewis. Once again Madjef has compiled a fresh variety of beats, loops, scratches, bass and lead lines, drums and fills, kicks, snares, and guitar samples in a construction kit format. (ID#1003)

Groovemasters Drums is a brilliantly recorded 2 CD collection that includes over '900' of the phattest loops for rock, pop, funk, and disco styles featuring a HUGE VARIETY of kit sounds AND more than 650 individual drum sounds, plus a fantastic FX section with loops treated with phasers, flangers + vintage guitar amps. Solid grooves, fills and variations - an essential addition to your arsenal of drum grooves. (ID#1013)



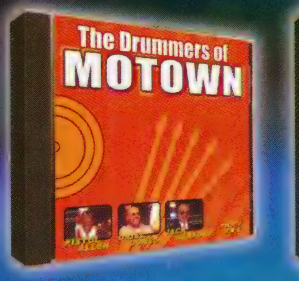
Deepest India is an exceptional 3-CD set of original samples that explores every area of musical emotion from elation to despair - from hauntingly beautiful vocals, through countless joyous orchestral ensembles to authentic indian instrumental phrases. There has never been anything as comprehensive as this collection available before. CD 1 - Vocals; CD 2 - Instruments; CD 3 - Orchestras & Ensembles. (ID#1033)



Hip-Hop Master is perfect for Hip-Hop, Rap, R&B and commercial Pop productions. Hip-Hop Master includes more than 1000 great drumloops from 70-120 beats per minute. 400 synths and complete chords, great basses (instruments & licks), funky guitars (instruments & licks), organs, pads, pianos and rhodes (multisamples), record effects, scratches, drumbreaks & rolls. This CD is a must for the serious Hip-Hop producer. (ID#1023)

Dance Mega Drums 2 includes over 4000 different Drum, Perc, and Drum machine samples. 100s of drum kits for dance music: Hip Hop Real Drums/Disco/House/Drum'n'Bass. 1332 Drum-kit samples, 473 Bass drums, 551 Snare drums, 246 Claps, Snaps and Rim-Shots, 367 HiHats, 70 Cymbals, 396 Perc and FX, 12 ultra rare drum machines. All samples are sorted and categorized. CD 2 is an Akai/Emu CD-ROM. (ID#1012)

This is the ultimate in house collections! 3 CDs full of the toughest house grooves, loops, basses, synths, vocals and FX. Tons of samples all BPM matched and grouped from top names in the house music world. If house is your poison, you'll never need another package! Total coverage! FIVE STAR ***** REVIEW: "Zero-G have come up with as close to the definitive resource for the house producer as could be imagined." (ID#1017)



The original "Hitsville USA" groove masters, Pistol Allen, Uriel Jones and Jack Ashford, who have played on over 350 hit records including "I Heard it Thru the Grapevine", "Tears of a Clown" and "My Girl". Over 90 tracks of beats and rhythms that had a major part in developing pop music. The material is presented in groove blocks based on Motown hits. Vintage recording techniques recreate the authentic Motown sound. (ID#1009)

AWARDED 9/10 by KEYBOARD (USA), and "5 STARS" by SOS (UK) - the only sample CD to offer an authentic Bristol Sound. Bristol has long been associated with innovation in music. Massive Attack, Portishead, Tricky, Goldie & Roni Size. Massive Loops compressed and squeezed dirt basses, trem guitars, small string sections and vinyl noise all add to the atmosphere, from Trip Hop to Drum'n'Bass. (ID#1031)

Winner of Keyboard Magazine's prestigious KEY BUY Award (FALL/1999), drummer Shawn Lee creates this great collection of phat and vintage break beats, along with some very fresh variations and sounds. These 'rawfunkindirty' loops were all recorded with old analog valve gear, giving it that true vintage sound. This collection provides the true raw sounds that were cut to vinyl and then mastered to CD from there. (ID#1020)

SAMPLERS & COMPUTERS ON THE PLANET!

A brilliant presentation of Beatles style string quartets, string ensemble pads, loops and 60's style rock construction kits that are made to fit into all styles of music. String quartets are presented in construction kits that include the individual cello, viola and violin parts for total user flexibility. Also included: vintage guitars, basses and drums played by vintage people. It's the totally cool Love and Pop String Thing. (ID#1051)

"With so much soundware available to the discriminating producer, it's getting harder for any one CD package to stand out. Percussive Adventures definitely stands out, which is why we gave it our KEY BUY award. Both the sheer amount of material and the freshness of the performance mark it as a must-have for composers of "world music." (KEYBOARD) - Need we say more? 2-CD & 4-CD/CD-ROM Set (ID#1045)

The loops on CHEMICAL BEATS have masses of attitude, huge drum sounds and FX crunched through advanced signal processors, mad percussion loops, thunderous basses, radio loops, cutting edge synth & guitar FX, plus a vast collection of drum & cymbal hits. 350 combinations are possible. One of the most flexible and awesome dance loop collections available and a winner of Keyboard's prestigous KEYBUY award. (ID#1002)

Awarded KEYBOARD's KEY BUY Award (JULY 1999) and the highest rating PLATINUM AWARD by Future Music, UK - N.Y. Cutz is a raw slice of East Coast Hip Hop from New York City. A double CD collection of Dope Beats, Tough Grooves, Chillin' Vibes and Phat Construction Kits from the streets of NYC. Grooves to get ya diggin'. Beats to get ya freakin'. Over 1000 beats, basses, keys, guitars, scratchin' and wackness. (ID#1005)

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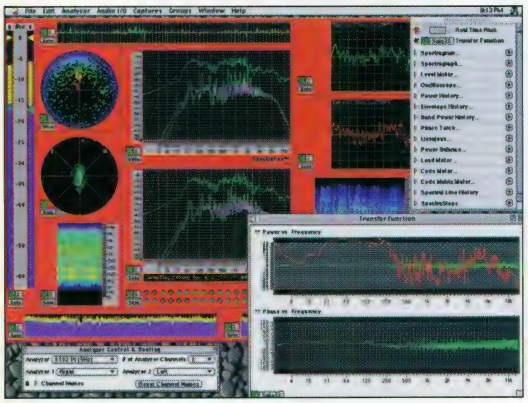
Keyboard Amps | *Samson & Genz-Benz*

Two keyboard combo amps have been introduced by Samson. While the **KM200** (**$699.99**, picturd at right) boasts 200 watts of power, a compression driver, and a 15" woofer, the **KM125** (**$539.99**) has a 125-watt amp, a compression horn, and a 12" woofer. Their cabinets are mono, but each features a four-channel stereo mixer and stereo XLR line outputs that can be routed to a house mixer or recording console. For stereo stage monitoring, two KMs can be linked via a TRS cable. Each amp also features a phantom-powered XLR mic input, a switchable seven-band graphic EQ in the master section, a metal protective grill, and casters.

Samson Technologies, 516-364-2244, www.samsontech.com. KEY INFO #131

The Genz-Benz **Gig Weasel UC4** (**$699.50**) provides four independent channels, each with XLR and 1/4" inputs. Also included are a 4-band master EQ, a built-in spring reverb, an effects loop, balanced XLR output, 135-watt power amp, a 12" woofer and compression tweeter, and a headphone jack with speaker switch. The UC4 measures 16" W x 15" D x 23-1/2" H, weighs 45 pounds, can sit upright or be tilted back on the floor, and will mount on a speaker pole.

Genz Benz Enclosures, 800-959-1809 or 480-941-0705, www.genzbenz.com. KEY INFO #132



Metric Halo SpectraFoo

24-channel metering for Pro Tools

Metric Halo Laboratories has introduced **SpectraFoo Radical3**, which provides up to 24 channels of metering and analysis using one DSP chip on Digidesign's Pro Tools|Mix system. Three versions are available: **MLM** (**$100**) features digital level meters, Lissajous phase scopes (X-Y, vectorscope, and stereo field display modes), full-featured audio frequency oscilloscopes, and power balance meters. **SpectraFoo** (**$500**) adds full-featured level meters with physical unit calibration, full-featured audio spectrum analyzers, spectrogram spectral history meters, correlation meters, correlation history meters, Phase Torch frequency-sensitive phase meters, envelope history meters, and band-limited history meters. **SpectraFoo Complete** (**$1,000**) includes all of the above with code meters, code list meters, code matrix meters, a 24-bit signal generator, a transfer function measurement system, and a capture, looping, and static analysis environment.

Metric Halo Laboratories, 888-638-4527 or 914-831-8600, in-foo@mhlabs.com, www.mhlabs.com. KEY INFO #133

BIAS Powerbook Edition Bundles

Portable digital studio solutions

Berkley Integrated Audio Software has announced the availability of products that provide digital and analog I/O for Mac and Win 95/98 laptop computers and digital recording and editing software. Each bundle contains the VXpocket from Digigram, which features 24-bit converters, a balanced analog stereo input for mic or line levels, balanced analog stereo output, and S/PDIF I/O for direct digital transfer. **Peak LE Powerbook Edition** (**$729**) includes Peak LE 2.0, Digigram VXpocket, Waves EasyWaves (compressor, EQ, and reverb plug-ins), SFX Lite, and Adaptec Toast. **Peak 2.0 Powerbook Edition** (**$899**) includes the same products, but it comes with Peak 2.0 instead of Peak LE 2.0. **BIAS Studio Powerbook Edition** (**$999**) comes with the same products as the Peak 2.0 Edition, as well as Deck.

Berkley Integrated Audio Software, 707-782-1866, www.bias-inc.com. KEY INFO #134

Neumann KMS 105

Live-performance vocal mic

Neumann's **KMS 105** (**$599**) is a supercardioid vocal microphone intended for live performance. It boasts a 127dB dynamic range, a 20Hz-to-20kHz frequency response, a 145dB maximum SPL, and reduced handling noise. It's available in nickel or matte-black casing.

Neumann USA, 860-434-5220, www.neumannusa.com. KEY INFO #135

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Visit www.keyboardonline.com and click on the KEY INFO button to request literature on products featured in New Gear and elsewhere in *Keyboard*.

by Mark Vail

411 newgear

McDSP CompressorBank

Compression plug-in for TDM & AudioSuite

Designed to emulate the sounds of vintage and modern compressors, McDSP's **CompressorBank** plug-in (**$495** for TDM and AudioSuite version, **$195** for AudioSuite-only version) provides unique knee and bite controls, multiple time-constant circuits, side-chain pre-filtering (high-, low-, and bandpass, parametric), and a static or dynamic post-EQ stage for enhancing, de-essing, harmonic distortion, and other EQ effects. CompressorBank comes with presets that simulate a variety of compressors and limiters, including the Teletronix LA-2A, UREI 1176 LN, Neve 2254E/33609, and dbx 165; users can also create their own compressors and limiters.

McDSP, 650-320-8452, www.mcdsp.com. KEY INFO #136

key news

Armadillo Enterprises is now the exclusive U.S. distributor of Oberheim products from Viscount. The current lineup includes the **OB-3²** organ keyboard and module (**$1,399** and **$899**, respectively), the **MiniGrand** piano module (**$450**), the **MC2000ex** and **MC3000** MIDI controllers (**$1,799** and **$2,299**, respectively), and the **GM400** and **GM1000** effects processors (**$799** and **$1,699**, respectively). Meanwhile, Oberheim is developing a couple of new products that are due within the first half of 2000: the **OB-12** 12-voice, four-part multitimbral modeled-analog synth, and the dual-manual **OB-5** organ (www.armadilloent.com). . . . BitHeadz has released MAS- and DirectConnect-compatable versions of **Unity DS-1 Sampler** and **Retro AS-1 Synthesizer** (**$449** and **$259**, respectively), which can run as plug-ins for Mark of the Unicorn's Digital Performer and Digidesign's Pro Tools. The **Osmosis** utility for Mac (**$179**) converts Roland- and Akai-format samples to Unity DS-1 or SampleCell files (www.bitheadz.com). . . . Event Electronics and Echo Corporation have decided to part ways. Echo will now distribute its own Layla, Gina, and Darla 24 products (see below), and will assume all support, including customer service and warranty repair (www.echoaudio.com). Event will continue to distribute its line of audio monitors and Røde mics, and has embarked on the development of a new line of digital recording products (www.event1.com). . . . Among other improvements, Symbolic Sound's **Kyma.5** (**free** to owners of the Capybara 320, **$150** to owners of older hardware, **$3,300** for a base system) provides a graphic user interface between the Capybara sound engine and the user, making it easier for beginning Kyma users by streamlining the sound-design process (www.SymbolicSound.com). . . . Audio Ease's **BarbaBatch 3.0** (**$395**, free upgrades from version 2.4 and higher; **$99** upgrade for earlier versions) can process audio content stored in formats including CD audio, QuickTime, Real Audio, MPEG, Sound Designer, AIFF, AIFCIMA, WAV, NeXT/SUN, and VOX (www.macsourcery.com). . . . According to Emagic, a future subrelease of **Logic Audio Platinum**, **Gold**, and **Silver 4.0** for Mac and PC will add support for Propellerhead's ReWire standard, allowing sample-accurate transfer of audio between software-based synthesizers and Logic Audio's mixer (www.emagic.de). . . . Last November 2, **Beatnik**, developer of interactive audio technologies and content for the Internet, signed an agreement to merge with **Mixman Technologies**, creators of Mixman Studio Pro audio remix software (version 3.0 reviewed Nov. '99). Together, Beatnik and Mixman possess an extensive music and sound library, including both Top 40 artists and professional music catalogs. No word yet on exactly how the two companies' technologies will be combined in new products.

Echo Mona & Layla 24

24/96 digital interfaces for Mac or PC

Echo Corporation's latest multi-channel digital recording interface, **Mona** (**$995**, shown below) features four universal inputs for connecting instruments and microphones directly to your computer. Mona provides XLR inputs and mic preamps, as well as 1/4" inputs that can be switched between balanced +4dBu line and high-impedance guitar levels. Mona uses the latest generation of 24-bit/96kHz converters, and offers six output channels, each available as balanced +4dBu on XLR connectors or unbalanced –10dBV RCA jacks. A headphone output is also provided. There are both S/PDIF and ADAT lightpipe I/O connectors for interfacing with other digital equipment. Mona's software drivers support the Windows, Macintosh, and BeOS operating systems and popular digital audio program interfaces. Multi-client drivers allow Mona to be used by more than one program at the same time, permitting simultaneous use of a software synth and digital recording software.

Also new to the Echo lineup is **Layla 24** (**$995**), a "next generation" multi-channel recording product that includes 24-bit/96kHz converters and Alesis ADAT lightpipe I/O.

Echo, 805-684-4593, www.echoaudio.com. KEY INFO #137

GET FREE INFO FAST AT www.keyboardonline.com

411 newgear

Microcon, Cyclodon, & Voice Spectra

Mini mono synth, analog sequencer, vocoder, & more

Drum Machine Museum is the exclusive U.S. distributor for the Technosaurus **Microcon** monophonic analog synthesizer (shown at right) and **Cyclodon** 16-step analog sequencer (**$329** each). Square and sawtooth waveforms can be generated by the Microcon's VCO, which is supported on the low end by a sub-oscillator. Variable glide allows portamento between notes. Microcon's LFO will produce a square or triangle wave, its resonant VCF operates in 12 or 24dB/octave mode, it has an envelope generator with AD and ADR modes and a manual trigger button, and its VCA can be driven via an AD envelope or gate control. It provides Roland-style CV and gate inputs, along with filter CV and audio inputs. Cyclodon offers knobs for adjusting each step's pitch or duration, CV and gate outputs, and a Roland-style sync input that will connect to a TB-303, TR-707/727/808/909, and most MIDI-to-Sync24 converters. Each unit requires a 12-volt DC power supply and has a footprint less than eight by four inches.

The Seekers **Voice Spectra** (**$699**) is a 12-band 1U rackmount analog vocoder with a built-in sawtooth oscillator that serves as a carrier signal. Quarter-inch inputs are provided for mic, instrument, and line-level inputs. The **UMC1688** MIDI controller (**$369**) has 16 programmable knobs, eight programmable faders, and eight programmable buttons. It can memorize 40 programs and store and receive program data to external devices via MIDI system-exclusive data.

Also available from the Drum Machine Museum are drum machine and synthesizer modifications. Check out their Web site for details.

Drum Machine Museum, 415-613-9862, www.drummachine.com. KEY INFO #138

soundbytes

The weirdest and wackiest of three new mixed-media, WAV/audio CD-ROMs (**$49.95** each) from Wizoo is **Cologne Cyclez I & II**, which is jam-packed with a whopping 1,000 breakbeats, noises, sound effects, psychedelia, and synth loops at a uniform speed of 133.33 bpm, which makes for good mix-and-match alchemy.

More sedate is **Hamburg Loopz II**, which features 300 loops based on Roland TR-808 and Alesis HR-16 patterns. Its creators broke out the effects box and dusted off analog synths to bend, twist, and warp the patterns.

For those into exploring the dark side, **LoFi-Junkiez 2** offers 95, 97, and 120-bpm loops created using the Akai MPC3000, Jomox XBase 09, Steinberg B.Box, and a bunch of special effects, courtesy of *Keyboard* columnist Craig Anderton. LoFi-Junkiez 2 delivers "massive electronic phunk inspired by Cologne's finest beer."

Wizoo, +49-221-9356790 or 718-963-2777, www.wizoo.com. KEY INFO #139

PG Music's **Oscar Peterson CD-ROM** for Windows (**$79.95**) includes 14 audio/video performances, ten MIDI transcriptions, an interactive autobiography, a photo gallery, a discography, and more from the jazz piano legend. Also available is an 18-track audio CD with over 200 pages of transcriptions (**$39.95**).

PG Music, 800-268-6272 or 250-475-2874, www.pgmusic.com. KEY INFO #140

Drum Machine Museum is distributing Discovery Firm products. Included are three audio CDs (**$59.95** each) created using familiar Roland products. **TB-303** contains acid loops, techno loops, individual hits, and sound effects. **TR-808** and **TR-909** each contain individual hits sampled using many possible parameter settings and processing techniques. The TR-808 also stars on two Discovery Firm discs for Roland's SP-808: **Breakbeat Ammo/Drum-N-Bass** and **Breakbeat Ammo/Hip-Hop** (**$24.95** each). Each features 54 breakbeat tracks (three banks plus bonus tracks) and single-shot samples.

Drum Machine Museum LLC, 415-613-9862, mickeyt@drummachine.com, www.drummachine.com. KEY INFO #141

If you're interested in making lounge music, check out the audio CD **Easy Listening** (**$99.95**) from Ueberschall. It merges music of the past — Bossa Nova, Latin, and Brazilian styles, as well as the kind of orchestral music heard in shopping malls, elevators, TV soaps, and B movies of the '60s and '70s — with trip-hop elements for a different sensation.

Ueberschall, +49-89-345026, www.ueberschall.com. KEY INFO #142

Kid Nepro's **Millennium-2** (**$200** for CD-ROM or Zip disk) is loaded with classic synth sounds from the Prophet-5, Prophet-VS, Fairlight, Wavestation, Juno-6, and more. Also included are SP1200-generated hip-hop drums and an assortment of electric piano, strings, R&B brass, East Indian percussion, and dozens of special effects for soundtrack and TV projects. Get both Millennium-1 and -2 for **$300**.

Kid Nepro Productions, 718-642-7802, proton@kidnepro.com, www.kidnepro.com. KEY INFO #143

GET FREE INFO FAST AT www.keyboardonline.com

411 newgear

Lexicon MPX 500 & MP 100

Dual-channel processor & Core2 option

Lexicon's **MPX 500** dual-channel digital effects processor (**$599**, shown below) is intended for both live performance and studio/production applications. It offers 240 presets, including classic Lexicon reverbs along with 5.5-second delay, echo, flange, chorus, pitch-shift, detune, rotary, and tremolo. Four dedicated front-panel knobs permit adjustment of effect parameters displayed in the LCD. Tempo-controlled delays lock to MIDI clock and a tap function; tap tempos can be controlled by audio input, the front-panel Tap button, footswitch, an external MIDI controller, or MIDI program change.

The **MP 100** (**$149**) is the latest option for Lexicon's Core2 desktop audio system. It incorporates effects and controls from Lexicon's MPX 100 dual-channel effects processor and puts them on a snap-on card. This option gives true stereo dual-channel processing with hundreds of presets including reverb, tremolo, rotary, chorus, flange, pitch-shift, detune, 5.7-second delay, and echo.

Lexicon, 781-280-0300, www.lexicon.com. KEY INFO #144

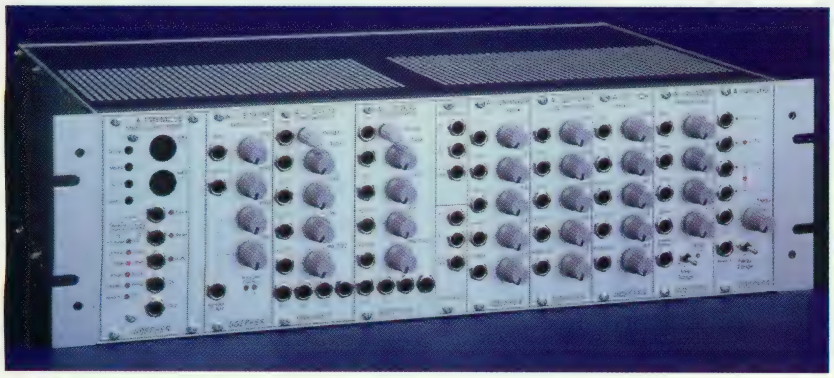
Now Shipping

As of November 1, 1999, these products were shipping:

• Sounds Logical **WaveWarp Version 1.1** object-oriented realtime audio effects tool for Windows ($595; www.soundslogical.com) • BitHeadz **Voodoo** sampling drum machine software for Mac and Windows (**$199**; www.bitheadz.com) • Roland **VM-7100** and **VM-7200 V-Mixing Processors** (**$1,995** and **$2,795**, respectively), **VM-C7100** and **VM-C7200 V-Mixing Consoles** (**$2,995** and **$3,695**, respectively), **SRV-3030** and **SRV-3030D Digital Reverb Processors** (**$695** and **$995**, respectively), and **DS-90 24-Bit Digital Reference Monitor** (**$595**; www.rolandus.com) • Mark of the Unicorn **FastLane-USB** 2x2 MIDI interface (**$69**; www.motu.com) • E-mu **EOS Link** software, which allows control of an Emulator 4-series sampler from a Mac or PC over SCSI (**free** with the E4XT Ultra, E-Synth Ultra, and E-6400 Ultra samplers, available for a **nominal charge** for the new E5000 Ultra sampler or for previous models of the E4 sampler line; www.emu.com) • Emagic **Unitor8MkII** 1U rackmount USB synchronizer and MIDI interface (**$799**), and the **AMT8** 8 x 8 USB-compatible MIDI interface for Mac and PC (**$499**) • McDSP **CompressorBank v1.0** TDM/AudioSuite plug-in (**$495** for TDM and AudioSuite version, **$195** for AudioSuite-only version).

Doepfer, Analogue Systems, & Analogue Solutions

MIDI controllers, synth modules, & modular synths



Enport, the U.S. distributor for Doepfer, Analogue Systems, and Analogue Solutions, has announced new products from those manufacturers. From Doepfer come these items: The **Drehbank** (**$495**) is a programmable 64-dial MIDI controller for use with software synths and sound modules. It features eight CV inputs for CV-to-MIDI conversion and removable ears for rackmount or tabletop use. The **Regelwerk** (**$775**) is a fully programmable 24-channel MIDI CC/sys-ex fader controller with an analog-style eight-track MIDI sequencer that offers CV/gate outputs for all eight tracks. Doepfer's **MCV24** MIDI-to-CV/gate converter (**$540**) is a MIDI-to-CV and MIDI-to-sync interface for controlling analog synths, drum machines, and sequencers equipped with CV, gate, sync, clock, start/stop, and reset inputs. It provides 24 analog outputs, each of which can output analog voltages or gate/triggers with definable voltage and polarity. Among the available Doepfer A-100 analog synth modules (sample system shown at left) are the **A-179** light-to-CV converter, **A-112** sampling/wavetable oscillator, and **A-127** voltage-controlled triple-resonance filter (**$95**, **$195**, **$195**, respectively).

Numerous analog modules and complete systems are available from the Analogue Systems Integrator line. Among the modules are the **RS20** ring modulator, the **RS40** noise, sample/hold, and clock, **RS70** preamp, inverter, slew module, **RS100** Moog-type lowpass VCF, **RS210** eight-octave fixed filterbank, and **RS200** 3 x 8-step sequencer (**$85**, **$110**, **$102**, **$117**, **$117**, and **$550**, respectively). Systems start at **$1,500**.

From Analogue Solutions (not to be confused with Analogue Systems) comes the Concussor line of sequencing and percussion modules and systems, which emulate the vintage Roland CR-78, TR-606, -808, and -909 drum machines. Among the Concussor percussion voice modules are the **BD78** bass/conga/bongo drum, **SD99** snare drum, **RC88** 808 rimshot/claves, and **SY01** drum synth (**$66**, **$110**, **$83**, and **$168**, respectively). Analogue Solutions' **CV88** step CV sequencer with eight step trigger outputs goes for **$117**, and the **SQ4164** with 16 independent step channels of CV or dual gate outputs lists for **$722**. Concussor systems range from **$750** to **$1,499**.

Enport, 402-398-0012, www.en-port.com. KEY INFO #145

NEW MIDSIZE

Introducing the 1642-VLZ PRO... 4 submix buses, 4 aux sends per

12x2x1 • 4 XDR™ preamps • 4 mono & 4 stereo chs. • 3-band EQ @ 12kHz, 2.5kHz & 80Hz + 18dB/oct.@ 75Hz low cut filter • 2 aux sends per ch. • Constant Loudness pan controls • 2 aux returns • RCA tape inputs & outputs • 4 channel inserts • XLR & TRS balanced outputs • switchable +4/mic level output • ALT 3-4 stereo bus • Control Room matrix with Assign to Main Mix & separate outputs • Ctl Rm/Phone level control • 12-LED metering plus RUDE Solo light • Aux 1 Pre/Post • EFX to Monitor • sealed rotary controls • built-in power supply • steel chassis

14x2x1 • 6 XDR™ preamps • 60mm faders • 6 mono & 4 stereo chs. • 3-band EQ @ 12kHz, 2.5kHz & 80Hz + 18dB/oct.@ 75Hz low cut • 2 aux sends per ch. • Constant Loudness pan controls • 2 aux returns • RCA tape inputs & outputs • 6 channel inserts • XLR & TRS balanced outputs • switchable +4/mic level output • ALT 3-4 stereo bus • Switchable AFL/PFL Solo • Control Room matrix with Assign to Main Mix & separate outputs • Ctl Rm/Phone level control • 12-LED metering plus Level Set LED & RUDE Solo light • Aux 1 Pre/Post • EFX to Monitor • sealed rotary controls • built-in power supply • steel chassis

16x4x2 • 16 XDR™ preamps • 60mm faders • 16 mono chs. • 4 sub buses + main L/R • 3-band EQ with sweepable midrange (12kHz & 80Hz shelving, 100Hz-8kHz mid) + 18dB/oct.@ 75Hz low cut • 6 aux sends per ch.• Constant Loudness pan controls • 4 aux returns • RCA tape inputs & outputs • 16 channel inserts • 8 direct outs• TRS balanced outputs • Switchable AFL/PFL Solo • Control Room matrix with Assign to Main Mix & separate outputs • Ctl Rm/Phone level control • 12-LED metering plus Level Set LED & RUDE Solo light • Aux 1 & 2 Pre/Post • Aux Send master section w/level controls • Solo buttons with LEDs • Stereo Aux Return assign section with EFX to Monitor & Main/Submix assign • built-in power supply • steel chassis • BNC lamp socket • Rotatable I/O pod allows 5 physical configurations

WARM, DETAILED SOUND
0.0007% THD
NEAR DC-TO-LIGHT BANDWIDTH

OVER 130dB DYNAMIC RANGE FOR 24-BIT, 192kHz SAMPLING RATE INPUTS
ULTRA-LOW IM DISTORTION & E.I.N. AT NORMAL OPERATING LEVELS
IMPEDANCE INDEPENDENT
BEST RF REJECTION OF ANY MIXER AVAILABLE

No matter how much you spend on a microphone, its ultimate performance depends on how it interacts with the preamp it's plugged into. For years, high-end outboard mic preamps have provided fidelity that just hasn't been possible with the "stock" mic preamps built into mixing consoles. Until now. Introducing **X**tended **D**ynamic **R**ange discrete mic preamplifiers. The first in-mixer preamps that can effortlessly amplify the most subtle of sonic nuances, creating an aural panorama that's breathtakingly realistic, excitingly vivid and truly 3-dimensional in scope. The first built-in mic preamps that are impedance independent and designed with full protection from hot-patching and dead shorts. The first compact mixer with mic preamps that really do sound like $500 to $2000-per-channel esoteric preamps.

It took us two years and a quarter of a million dollars. And you probably won't believe it until you actually audition the XDR™ circuitry with a high quality condenser mic. But it's true: Verifiable with your ears. Verifiable on the lab bench.

XDR's Controlled Interface Input Impedance system accepts an enormous range of impedances without compromising frequency response. Whether the mic/cable load is 50 ohms, 150 ohms or 600 ohms, XDR™ mic preamp frequency response is down less than one tenth of a dB at 20Hz and 20kHz!

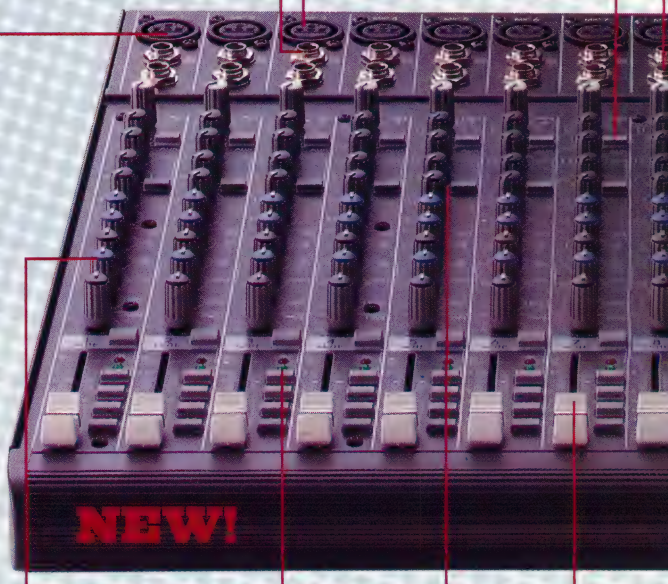
Many mixers that tout low E.I.N. specs can't deliver that

10 XDR™ mic preamplifiers with the finest sound quality (and specifications) ever on a mixer of any size. 0dB to 60dB gain range.

10 mono mic inputs (Chs. 1-10) and **8 mono line inputs** (Chs. 1-8), with +15dB to −45dB gain range.

Inserts on the first eight 1642-VLZ™ PRO channels.

75Hz low cut filters on all 10 mic channels. Sharp 18dB/oct., phase accurate circuitry cuts infrasonics caused by room and stage rumble, wind noise, mic clunks, P-pops & other crud.



Sweepable midrange EQ on Chs. 1-8. Incredibly wide 100Hz-8kHz sweep range lets you use this control as a second HF or LF control, too! Fixed shelving HF EQ at 12kHZ. Shelving LF at 80Hz.

Overload and ultra-sensitive, hyper-twitchy −20dB **Signal Present LEDs** on every channel.

4 aux sends per channel. 15dB of gain above Unity to drive wimpy effects processors. Auxes 1 & 2 are pre/post switchable; Auxes 3&4 are fixed post-fader.

60mm logarithmic taper faders with ultra-long-life resistance elements provide linear volume change from full-on to ∞.

LUXURY VLZ PRO MIXER!

10 XDR mic preamp channels and 4 stereo line channels, channel, sweepable mid EQ and more for just $999*

4 stereo line inputs (on Chs. 9-16) with +15dB to −45dB gain range.

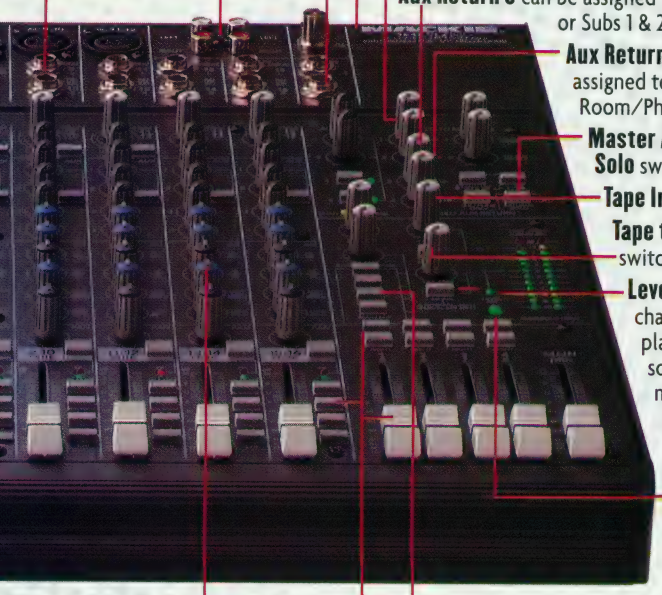
Dual headphone ouputs.

RCA inputs and outputs with tape input level control.

On the back: Direct outs (Chs. 1-8, bal./unbal.), TRS mono main output with level control, XLR stereo main outputs with recessed mic/+4 line level switch.

Effects to Monitor controls on Aux Returns 1 & 2 let you fold EFX back into stage monitor mixes independent of main PA.

Aux Return 3 can be assigned to Main Mix or Subs 1 & 2 or 3 & 4.



Aux Return 4 can be assigned to Control Room/Phones only.

Master Aux Return Solo switch.

Tape Input Level.

Tape to Main Mix switch.

Level-set LED + channel strip in-place stereo solo buttons make initial level setting fast and accurate.

RUDE solo LED in bright ecologially-correct green.

4-band EQ on Chs. 9-16. With 12kHz HF, 3K Hi-Mid, 800Hz Low-Mid and 80HZ LF.

True 4-bus configuration with bus assigns on every channel and master LR assign switches. Bus outputs are duplicated (**double-bussed**) so you can hook up all 8 channels of a digital recorder without constant re-patching.

Control Room/Phones Section with separate headphone and control room level controls. Source Matrix selects any combination of Main Mix, Subs 1 & 2, Subs 3 & 4 or Tape. In studio applications, the matrix gives you exceptional monitoring flexibility. During live mixing, it lets you create a third stage monitor mix or separate feed.

* $999 suggested U.S. retail price does not include extra toppings or optional thick Sicilian crust. Your price may vary. No user-serviceable parts in this footnote.

performance at normal +20 to +30dB gain settings. Our XDR™ design maintains lower noise levels in this "real world" operating range than even mega-expensive outboard designs.

The more sensitive a preamp is, the more likely it is to also pick up radio frequency interference (RFI). XDR™ incorporates bifilar wound DC pulse transformers with high permeability cores that reject RFI without cutting audible high frequency response. Plus we direct-coupled the circuit from input to output and used pole-zero-cancellation constant current biasing. Bottom line for the non-technical: Our VLZ™ PRO Series has the best RFI rejection of any mixing consoles in the world. Period.

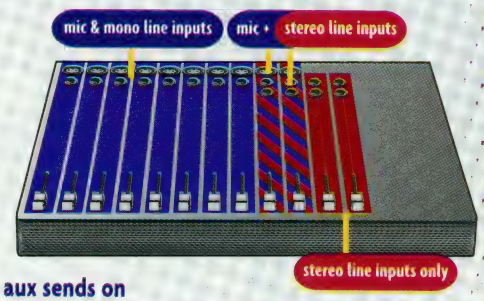
Hearing is believing. Visit a Mackie Dealer and audition XDR™ mic preamps with a really high quality condenser mic. Then get a 1642-VLZ™ PRO. Think of it as ten expensive esoteric stereo mic preamps... with a really excellent compact mixer attached.

1642-VLZ PRO

Lots of keyboards? On-stage DJ? Electronic drums? The 1642-VLZ PRO has the inputs and features you need.

You asked. We listened. Scads of stereo line level inputs plus ten of the finest mic preamps ever offered on a compact mixer.

The 1642-VLZ™ PRO is packed with features that make live mixing easier and more creative: EFX To Monitor for folding effects back into two separate monitor mixes, dual pre-fader



aux sends on every channel, sweepable midrange EQ, 75Hz low cut filters to cut stage rumble and wind noise, Control Room/Phones switching matrix that can be used to create a third monitor mix, Tape to Main Mix switch for music during breaks, mono output with level control and XLR stereo outputs with recessed mic/line level switch.

And unlike any other mixer with this kind of live mixing chops, the 1642-VLZ™ PRO is also a superb studio recording console (just like its bigger brother, the legendary 1604-VLZ™ PRO.) The 1642-VLZ™ PRO is configured to make recording incredibly easy with two dedicated channels for tracking, eight for monitoring and two stereo channels for effects. Plus "double-bussed" submix outputs so you can feed all 8 channels of your recorder without having to re-patch.

Call toll-free or visit our web site for complete information on the new midsize luxury 1642-VLZ™ PRO. Learn why it's the best compact live sound mixer value on the planet.

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25 GIANTS OF KEYBOARD MUSIC

25 years 1975-2000

Over the past quarter-century we've profiled hundreds of fascinating artists — one-hit wonders, titans from the pages of history, dedicated specialists in esoteric genres, celebrities who happen to play a little piano, and on and on. While each has contributed something vital to our musical world, a very few stand head and shoulders above the rest.

Who are these titans? You'll recognize most — maybe all — of the names. These are the players whose pioneering work has had a decisive influence on others working in their genre. All of them have reached a wide public audience as well — but just selling lots of CDs wouldn't be enough to put them on the list: All of them have demonstrated, in one way or another, a decisive technical mastery of the musical resources provided by keyboards and technology, and have continued to produce groundbreaking work over a significant period of time.

Narrowing the list to 25 was tough. Some of our personal favorites had to be omitted to keep the list manageable But when the dust cleared, the whole editorial staff was able to agree that the folks on the following pages are the top keyboardists of the past 25 years. JIM AIKIN

compiled by Mark Vail

Tori Amos

Not since Billy Joel and Elton John has there been such a celebrated piano-based artist in major radio rotation. **Tori Amos** defied tradition, going against the grain by writing unconventional, anti-pop pop songs and lacing them with cutting, no-holds-barred lyrics.

Against all odds, Tori, who had previously been dropped from a major-label recording contract, became an international icon. "In America there's this radio thing of 'Where do they fit?'" she told us in 1992. "'Tori, we don't know where she fits.'" Tori made her music fit, and she made it stick. And how refreshing it was to see an artist whose heart was so deeply in her relationship with her chosen instrument. "I wrap my arms around the piano and embrace it," she said in the same interview. "I see the piano as a living being. I started to approach it as something that has its own consciousness. It thinks. It's not like master and servant. We collaborate together." GR

The Long & Winding Road

Guitar Player magazine is founded by Bud Eastman. Bud's original goal, destined never to reach fruition, is to establish a nationwide network of clubs for guitarists. The magazine is intended to be a newsletter for the club. But Jim Crockett, hired in 1970 as an assistant editor, has other ideas.

1968

Contemporary Keyboard is announced at summer NAMM by *GP* publisher Jim Crockett (right) and editor-to-be Tom Darter.

1975

Sept. 1975

Dominic Milano, who has never dummied a magazine in his life, discovers that he's left a four-page hole in the 52-page first issue. He and Tom scramble frantically to fill it before the deadline.

Illustration by Octavio Diaz

The Artist/Prince/☥

"Synthesizers are total freedom," **the Artist formerly known as Prince** has said. Listen to any of his 25-plus albums and you'll get a sense of what he means. From his earliest pop tunes on *Dirty Mind* to the electronic orchestral excursions of *Kama Sutra*, the Artist has used synths not only for sweetening but as integral compositional elements. His keyboard chops are legendary, and while onstage he has generally relegated keyboard pyrotechnics to the back seat in favor of blazing guitar solos, he's recorded plenty of tracks that ooze with incredibly funky Clav or soulful acoustic piano.

But most of the Artist's brilliance lies beyond the boundaries of instrumental excellence. Stylistically, his recordings have been as innovative as they've been funky, never fitting within the confines of any one genre — the result of his passion in equal proportions for songwriting with technology and just plain playing the hell out of a tune onstage. ER

Wendy Carlos

Strange as it may seem in these techno-saturated days, the first time most of us heard a synthesizer — or even heard *of* one — it was being used to play Bach. The year was 1968, and **Wendy Carlos's** landmark *Switched-On Bach* moved up the charts to become, at the time, the best-selling classical album in history. Recorded one monophonic line at a time, with no sequencing, on a Moog modular and reel-to-reel tape, the album was a *tour de force* that succeeded not merely because of its novelty value but because of its sheer musicality.

Since then, Wendy has released a series of albums — classical repertoire, film scores, and her own compositions. She is widely admired for her painstaking craft and her thorough understanding of the nature of sound. Her experiments in additive synthesis and alternate tunings have been influential. But for better or worse, she's one of those artists whose most significant impact came at the very start of her career. JA

Chemical Brothers

After singles such as "Chemical Beats" became underground rave sensations, the **Chemical Brothers** unleashed their debut album, *Exit Planet Dust*, in 1995. The gargantuan beats, distorted acid leads, sampled guitars, and tension build-ups that persisted on *Exit* were hugely influential on the global dance music scene, spawning a host of imitators and even the new genre "big beat." On their subsequent albums, duo Ed Simons and Tom Rowlands have continued foraging for new ways to mangle sounds over thumping beats.

Beginning humbly in a bedroom with an Akai S1000 and a Roland Juno-106, the Chemicals have exploded into one of the few dance groups to cross the boundaries of rock and techno and to fill arenas in both the States and the U.K. Silencing many skeptics, the group has proved onstage how exciting and spontaneous live dance music can be. MR

Chick Corea

By agreeing not only to be interviewed for a cover story in the first issue of *Contemporary Keyboard* but to write a monthly column for us, **Armando Anthony "Chick" Corea** gave our fledgling magazine real legitimacy. Recognized as one of the leaders of the mid-'70s jazz-rock fusion, Corea is a musical chameleon who has dazzled listeners around the world with his fleet-fingered piano work.

As Greg Rule wrote in November '95, "Whatever the genre, Chick Corea emblazons a bold, brilliant, unique signature across its face." From his early experiments in free jazz, Corea has moved on to explore his Latin heritage and a blend of classical influences. Whether fronting his own ensembles Return To Forever and the Elektric Band, sharing the stage on dual grand pianos with Herbie Hancock, or accompanying jazz vocalist Bobby McFerrin, Corea has carried it off with a style and aplomb few could match. MV

The first issue rolls off the presses.

October 1975

We announce an upcoming cover story interview with Stevie Wonder — somewhat prematurely, as it turns out.

May/June 1976

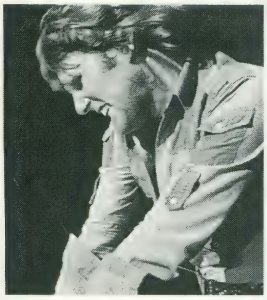
A fake "editorial assistant" named Taylor Young, added to the masthead to make the fledgling magazine's staff look more robust, is unceremoniously axed. (We later receive a letter from an incensed reader who tells us we ought to dump Jim Aikin's record reviews and bring back Taylor Young — odd, since it had been Jim [right] who was writing under the Taylor Young byline all along.)

Dec. 1976

Depeche Mode

For synth lovers, **Depeche Mode's** songs are like soundtracks to much of the '80s and '90s. Never content to rest on their laurels, the Modemen transformed themselves from sugar-coated synth popsters (*Speak and Spell*) to dark lords (*Black*) to plugged-in rockers (*Songs of Faith and Devotion*) to edge-cutting technologists (*Ultra*). All the while, they wrote razor-sharp melodies that simply could not be ignored. Of all the '80s synth bands, DM has stayed the course, continuing to fill major arenas with diehard fans.

Wrote Robert L. Doerschuk in 1993, "Long after many other pioneering synth rock groups sequenced their last synth bleeps, the Mode is still at it. They devote ample time to perfecting whatever it is that defines their style. The *Songs of Faith and Devotion* sessions added up to eight months of meticulous recording, mixing, and tweaking. As a result, we now have an album on which their sound is — paradox again — more developed yet more enigmatic than ever." GR



Keith Emerson

If he wasn't wrestling onstage with a Hammond organ, he might be stabbing knives into its manuals. Then he'd fire off some fireworks in mid-solo from his modular Moog's ribbon controller. On one tour he and a grand piano spun vertically as if inside a Ferris wheel. But **Keith Emerson** proved his keyboard mastery by ripping through brilliant personal renditions of Bach, Moussorgsky, and the like. His Moog solo in "Lucky Man" on *Emerson, Lake & Palmer* — ELP's first album — was a defining moment: the birth of rock synthesizer.

In an age when guitar players tended to hog the spotlight, Emerson stood out. No one else captured the hearts of fledgling rock keyboardists through the '70s and '80s the way he did. Of course his boyish good looks and athletic physique — often accentuated by black leather outfits — didn't hurt the cause. Nor did the fact that Keith is, pure and simple, a great human being. MV

Brian Eno

At the beginning, with glam-rockers Roxy Music, **Brian Eno** was processing sounds onstage through an EMS AKS synthesizer. Later he all but invented ambient music with *Music for Airports,* pioneered the idea of combining found-voice samples with funk grooves in *My Life in the Bush of Ghosts,* and produced a few platinum albums for U2. His installation pieces have combined walk-through visual art with quasi-random multi-speaker music. And while not known as a keyboard player, he was a demon DX7 programmer.

Again and again in a wide-ranging career, Brian Eno has reinvented himself. At every step, he has challenged us to reexamine the assumptions by which we make music. Though he has enthusiastically embraced previous technologies, he has recently come out against computer-based recording workstations, complaining about how hard it is to use a computer in a spontaneous way. Whether or not we agree, Eno is one of those artists whom it would be a mistake to ignore. JA

Bill Evans

Before leaving us in 1980 at the tragically young age of 51, **Bill Evans** established himself as an unparalleled lyrical jazz pianist. After touring in 1958 with the Miles Davis Sextet, Davis was quoted as saying, "Bill Evans plays the piano the way I like to hear it played."

Evans' sophisticated chord voicings and fluid melodic improvisations influenced many other jazz pianists throughout the '60s, and '70s, and his influence reverberates today in the younger generation. He was a quiet, introverted man who caressed the piano instead of attacking it. Jazz journalist and former *Keyboard* columnist Leonard Feather once wrote, "He had something in common with the gifted actor who, irritated by too much coughing in the audience, begins to speak his lines so softly that the audience is virtually obliged to subside into respectful silence." His live performances with his trio, however, included searing, soaring flights of pure piano energy. Evans made plenty of recordings, so the joy in his music will live on. MV

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KEY INFO #26

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Jan Hammer

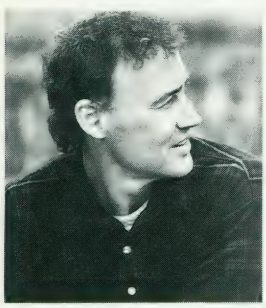
Whether he was trading scorching synth leads with guitarists John McLaughlin, Jeff Beck, Al DiMeola, or Neal Schon, scoring the '80s hit TV show *Miami Vice*, or sculpting the fabulous synthetic landscapes on the out-of-print *First Seven Days*, **Jan Hammer** has always done things differently. His brilliant use of Rhodes, Minimoog, and Oberheim SEM fueled the fire that was known as the Mahavishnu Orchestra, one of the leading lights of the jazz fusion movement of the '70s. After Hammer played on Beck's *Wired* and *There and Back*, Beck called Hammer his favorite guitar player — based on the uncanny guitar-like lines Hammer played on synth through an MXR flanger and guitar amp.

Until Hammer demonstrated his amazing pitchbend techniques, synthesists played like pianists. He found the soul in the technology, and few lead players since have approached the exultation and ecstasy of his playing. MV

Herbie Hancock

One of the greatest jazz composers and performers, **Herbie Hancock** has managed to maintain a remarkable level of artistic growth for over 40 years. His initial fame with funky crossover hits such as "Watermelon Man" and "Cantaloupe Island" brought him to the attention of the wider jazz public early on in his career. But it was his compositions such as "Dolphin Dance" and "Maiden Voyage" as well as his playing on his own Blue Note albums that made him the idol of nearly every jazz pianist.

When he took off with his synth and electronic keyboard-based funk unit, the Headhunters, Hancock made it acceptable for jazzers to own up to their love of gizmos and grooves. And he never lets up, either with his love for the piano or with his creative development. ER



Bruce Hornsby

In the mid-'80s, **Bruce Hornsby** burst onto the charts with "The Way It Is," which featured interwoven piano lines and wistful musings about society's ailments, underlaid by a pulsing LinnDrum. His acoustic artistry flew in the face of the day's dominant, nerve-jangling pop, yet his music struck a chord with listeners and the record rose to the top of the charts.

Pop isn't all that's in Hornsby's bag of tricks. "Rock piano playing is a very limited idiom," he once said. "My thing has always been to take a style that comes out of jazz and put it into a rock area." Between the deaths of Grateful Dead keyboardist Brent Mydland in '90 and guitarist Jerry Garcia in '95, Hornsby recorded and toured extensively with that free-wheeling troop. He names Robbie Robertson and Bob Dylan as songwriting influences, although he's been compared to Burt Bacharach, Don Henley, Bonnie Raitt, and Clint Black. With his broad-ranging skills, Hornsby promises continued success. MV

Jean-Michel Jarre

Since the release of his groundbreaking *Oxygene* in '77, **Jean-Michel Jarre** has reeled out dozens of inspiring electronic new age albums. He's also conducted fantastic outdoor multimedia concerts in locations including Moscow, London, Paris, and Houston, Texas. For more than two decades Jarre has maintained a prominent position as Europe's leading ambassador of electronic music.

In the studio, Jarre has always depended on a wide range of state-of-the-art, vintage, and custom-built synthesizers, sequencers, and drum machines. A typical Jarre concert includes multiple synthesists, percussionists, guitar players, brass sections, choirs, orchestras, rear-projected films, searchlights, fireworks, draped or externally lit high-rise buildings, lasers, a pyramid-enclosed stage, and projections of images such as JFK, Salvador Dali, and Jacques Cousteau. While Jarre's approach to electronic music owes little to the rave-influenced styles of a younger generation, his continuing success and performance grandeur set him apart. MV

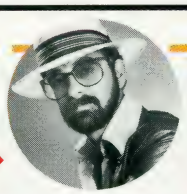
Our cover features a woman artist — Suzanne Ciani — for the first time.

June 1979

The Fairlight CMI, the world's first keyboard-based digital sampler, debuts. As detailed in our Aug. '92 Vintage Synths column, it does eight-bit sampling with eight identical voice cards, each capable of playing one voice at a time and stocked with its own 128K of memory.

1979

Our first Rock Technique column by Tom Coster.



August 1980

Keyboard celebrates its 5th anniversary.

Sept. 1980

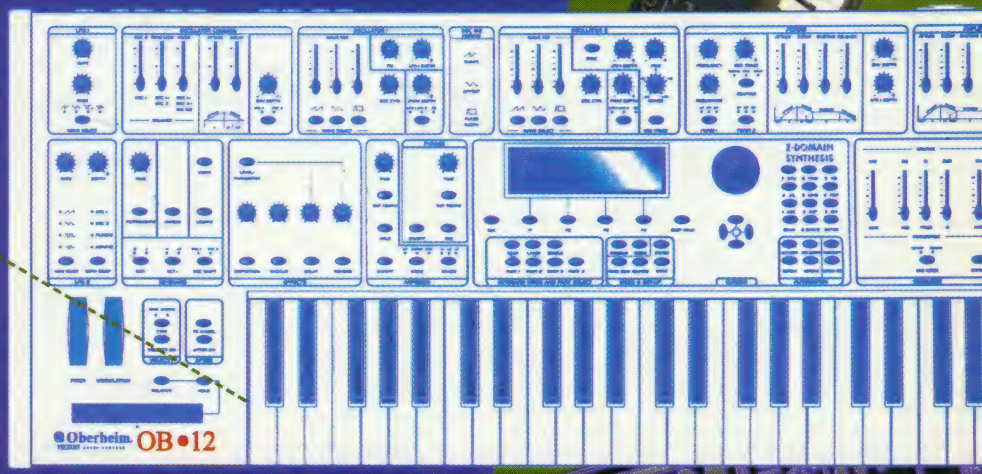
The Long & Winding Road

future past

building upon the past

Oberheim

the new OB•12 synthesizer from Oberheim



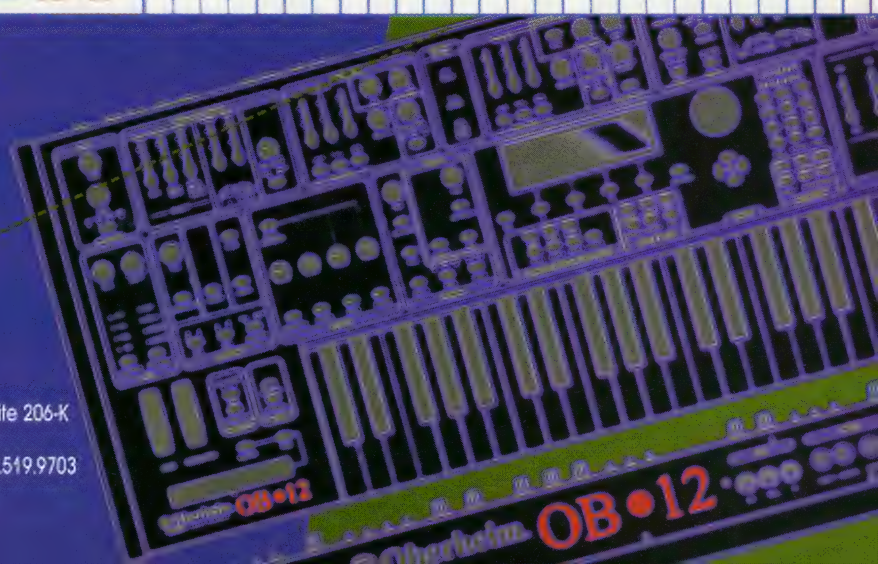
motion recorder

morphing

wavemix

phrase recording

analog and digital output



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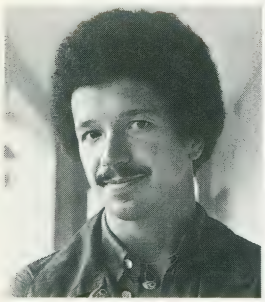


Keith Jarrett

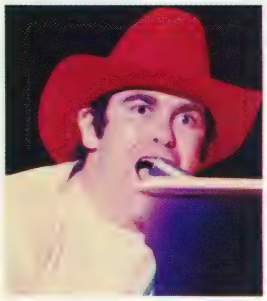
One of the most profound and thoughtful pianists in any genre, **Keith Jarrett** has made creativity and integrity into essential elements of any jazz pianist's development. His recordings of improvised solo concerts (*The Köln Concert*, *The Vienna Concert*) influenced an entire generation of pianists, jazz and otherwise. Many of his early albums, such as *Belonging*, have yielded original compositions that have become standards. He has also led one of the best trios in jazz history, with drummer Jack DeJohnette and bassist Gary Peacock. Their numerous records are the very definition of group improvisation, ensemble playing, and attention to time.

A true scholar of keyboard instruments and literature, Jarrett has also made several outstanding recordings of classical repertoire, such as the Shostakovich *24 Preludes and Fugues*, Handel harpsichord sonatas, and J.S. Bach *Well-Tempered Clavier*. Deep musical experiences, all. ER

Billy Joel

After extensive touring over the past quarter century, rock 'n' roll's Piano Man, **Billy Joel**, announced in April '99 that he was quitting . . . touring, that is. We're hoping he'll continue to concertize as well as churning out more hits, because few performers can put on a piano show the way he does. Even though he just reached his 50th birthday, Joel still wails with both fists and belts with the full-lunged voice of a god.

In his January '90 *Keyboard* cover story on Joel, Robert L. Doerschuk noted, "Armed only with a piano, he can hammer together sharp hooks and sophisticated changes, and flavor it with some genuine streetwise soul. Need a deathless ballad? He'll give you 'Just the Way You Are.' A more inspiring alternative to 'New York, New York'? Here's 'New York State of Mind.' Something that evokes the Beatles? The Stones? The classic Stax records? You got it, and with anchovies if you wish." MV



Elton John

Regardless of whether he wears a feather boa, goggle-sized glasses, a captain's hat, or a leather vest, there's no disguising rock piano's flamboyant superstar, **Elton John**. He's proven equally adept at pounding out rockers and crafting sweet love songs. Genres he's covered include soul, disco, country, ballads, and prog rock. In '94 he co-penned the soundtrack for Disney's animated *The Lion King*, which brought him Grammy, Academy, and Golden Globe Awards for "Can You Feel the Love Tonight." His piano playing has always been first-rate, and he sings beautfully or raucously as needed.

Elton set the pace for pop in the early '70s, and has put out at least one Top 40 single each year from '70 to '96. Whether he's reminiscing about Marilyn Monroe or Princess Diana in "Candle in the Wind," a special love in "Your Song," or cruising in "Saturday Night's Alright (for Fighting)," Elton gives it his all and then some, and his fans love him for it. MV

Kraftwerk

It's been said that **Kraftwerk** re-wrote the future. At a time when other artists were using synthesizers half-apologetically, or trying to make them sound more human, Kraftwerk embraced (with tongue in cheek) the soulless glitz of the machine. This stance, and the flawless hooks of proto-dance tunes like "Trans-Europe Express," made them one of the most forward-looking and revered electronic music groups of all time. *Computer World*, their eerily prophetic landmark released in 1982, set the pace for a generation of techno pretenders.

In 1982 Jim Aikin wrote, "Our relationship with our world has been changed forever by technology. The changes in music alone have been immense, and Kraftwerk has documented the changes both in music and in the world at large in a way that few other artists have." Kraftwerk reunited in 1998 for a highly publicized and critically acclaimed world tour. GR

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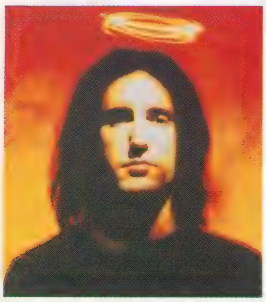
Mac Rebennack (Dr. John)

With as much personal experience with American music history as he has, **Mac Rebennack** should be designated a National Treasure. Not only is he a walking encyclopedia of popular piano stylings, but he has also performed or collaborated with a *Who's Who* of significant artists and songwriters whose careers span the past half-century.

His initial fame came from his 1968 semi-psychedelic album *Gris-Gris*, released under the name Dr. John the Night Tripper. His mastery of New Orleans piano styles is unsurpassed; he came up playing alongside James Booker and Alan Toussaint. But he sees himself primarily as a songwriter — and with his tally of tunes approaching 400 annually, it's no wonder. His autobiography, *Under a Hoodoo Moon* (St. Martin's), is essential reading for anyone interested in American song and piano styles. ER



Trent Reznor

No musician did more for electronic music in the '90s than **Trent Reznor**. Not only did he write and record a string of groundbreaking records (*Pretty Hate Machine*, *Broken*, *The Downward Spiral*), he did so during the height of guitar/grunge mania, at a time when the "own a synth, go to jail" mentality prevailed. His anguished, snarling vocals inspired an army of hardcore synth pretenders.

Trent forged a path through the era like a wrecking ball. "Maybe synthesizers are considered unfashionable these days," he said in 1994, "but I don't give a fuck." And he didn't. While other bands hid their keyboards offstage behind a curtain, Trent brought them front and center. His songs and productions were brilliant beyond words. Today, a decade after his mainstream debut, he shows no signs of decline. The latest Nine Inch Nails release, *The Fragile*, debuted at #1 on The Billboard 200. GR

Jimmy Smith

Before he came along (and all too often since then) the organ was synonymous with light, bouncy music. **Jimmy Smith** slashed his way through the cliches, and made the Hammond B-3 a serious jazz tool. For 46 years he's manned the organ like no other artist, and he still swings hard today. He's laid down sizzling grooves behind giants like Charlie Parker, John Coltrane, and even Michael Jackson. John Medeski — a killer young organist in his own right — credits Smith as being "the line between blues and bebop."

Through the '50s and '60s, Smith cut trendsetting albums that continue to influence young keyboardists. Although he wasn't the first jazz organist, he's considered the definitive master. In 1988 Robert L. Doerschuk wrote, "His registrations are clean and subtle, and he uses just the right touch of percussion. His left-hand and pedalboard bass lines prowl restlessly, and his solos exploit the B-3's meaty texture, alternating between understated low-register lines and dramatic jabs into the treble stratosphere. Jazz organ starts here." MV

Tangerine Dream

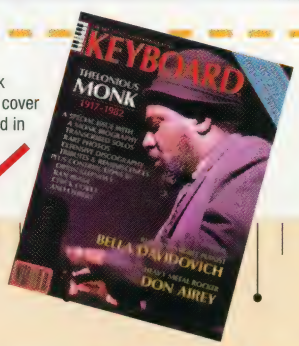
A true vanguard of electronic music, **Tangerine Dream** has influenced a wide spectrum of musicians, from serene new agers to visionaries of hard trance and ambient. In 1981, their extended improvisations were described in *Keyboard* as "an audio version of a surrealist painting." Even with personnel changes — Christopher Franke and Paul Haslinger went on to prosperous solo careers, while founder Edgar Froese is still onboard with his son Jerome — the group has remained prolific; their discography is approaching 100 albums.

The group was also a driving force in music technology during the '70s and '80s. They commissioned custom-built modular synths suitable for live performance and pushed the development of digital sequencer and synth capabilities. TD also heavily modified their own equipment and were among the first to experiment with sampling. MR

We change our name from *Contemporary Keyboard* to *Keyboard*, spawning any number of jokes that, sadly, our coverage is no longer contemporary.

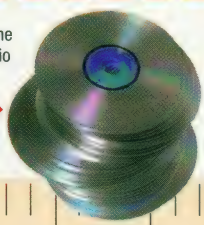
July 1981

Thelonious Monk dies. Our tribute cover story is published in July 1982.



Feb. 16, 1982

Digital audio reaches the masses — the CD audio format is introduced.



1982

The Long & Winding Road

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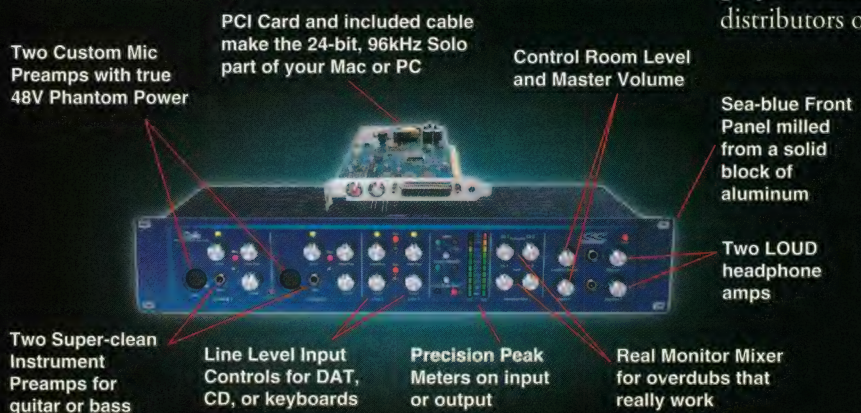

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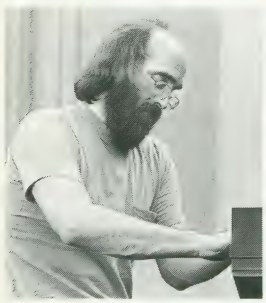
Rick Wakeman

While still a teenager, **Rick Wakeman** found himself playing sessions with Black Sabbath, Al Stewart, David Bowie, and the Strawbs. He stepped into the spotlight as a monster prog rock keyboardist with the release of Yes's *Fragile* in 1971. His on-and-off relationship with Yes continued through 1989's *Anderson, Wakeman, Bruford & Howe* regime and 1991's *Reunion* tour, on which he shared keyboard duties with the man he'd previously replaced, Tony Kaye.

Early on, he created a couple of critically acclaimed solo albums. *The Six Wives of Henry the VIII* (1973) proved that a rock album could be made primarily with keyboards, and *Journey to the Center of the Earth* (1974) proved that rock music could borrow the large scope of a symphony orchestra without selling out. In the heady days of prog rock in the late '60s and early '70s, Rick Wakeman vied with Keith Emerson for the keyboard crown. Even if his glory days are behind him, his place in keyboard history is assured. MV



George Winston

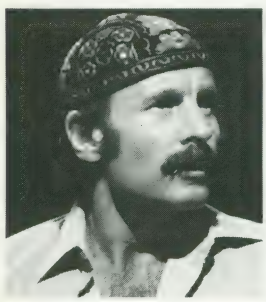
While his chart-topping *Autumn* defined the genre of new age piano in the mid-'80s, **George Winston** looked like a refugee from an earlier era. "He could have stepped barefoot out of the '60s," wrote Robert L. Doerschuk in his January '84 *Keyboard* cover story on Winston, "full beard, flowing pony tail, and all. His music is more of a paradox, though, touching on a broad range of pianistic influences that stretches back to old-timey stride players, leaps up to modern meditative minimalists, and, at least on the surface, skips over late '60s rock untarnished."

Winston played rock organ before hearing Fats Waller records in the early '70s. The latter influenced him to compose stride and blues piano pieces. He then began experimenting with slower, more reflective improvisations. There wasn't much interest in such music at the time, so he quit playing for two years before bursting forth as a unique and refreshing force in the piano world. MV

Stevie Wonder

He was only 11 when he started recording in 1962, and within two years **Stevie Wonder** became one of Motown's most important artists. During his nine years under Motown contract, he produced 22 albums and wrote songs for the Spinners and Smokey Robinson, among others. In 1971 he broke free of his restrictive contract and recorded *Music of My Mind* mostly by himself. Since then he's released a series of unforgettable albums, including the '70s classics *Talking Book*, *Innervisions*, and *Songs in the Key of Life*.

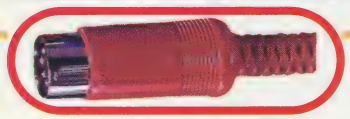
In his Wonder *Keyboard* cover story, which took 20 years to realize, Robert L. Doerschuk defined the components of a Wonder song: "exuberant vocals, catchy hooks, weirdly articulated lyrics, layer after layer of keyboards over traditional dance rhythms peppered with multicultural references." Wonder is not only a superb singer, he's also an amazing multi-instrumentalist — and he can hold his own on keys with anyone. MV



Josef Zawinul

A memorable seven-note bass line introduced **Josef Zawinul** to the general public in 1977: The ARP 2600 intro to "Birdland" on Weather Report's *Heavy Weather*. Although the Vienna-born Zawinul had earlier appeared on dozens of recordings with the likes of Miles Davis, Dinah Washington, Cannonball Adderley, Joe Henderson, and Aretha Franklin, and had released eight prior albums as part of WR, it was "Birdland" and his unique sense of synthesizer tone that put him on the map.

Zawinul began his musical studies at the Vienna Conservatory when he was seven — starting on accordion. "The accordion is the original synthesizer," he once said. He moved to New York in 1958 and landed a job with Maynard Ferguson's orchestra. His association with electric keyboards began with Davis, with whom Joe recorded *In a Silent Way*, *Bitches Brew*, and *Live-Evil*. His talent is legendary and his technique and timbres unique. MV



The birth of MIDI. Bob Moog introduces MIDI to the readers of *Keyboard* in a feature in the July 1983 issue.

Early 1983

Yamaha releases the DX7 (reviewed Oct. '83).

Sept. 1983

Passport Designs releases the first MIDI sequencer, MIDI/4 for the Apple IIe, based on their existing Soundchaser system, which includes sequencing software, a synthesizer on a soundcard, and a performance keyboard.

1984

The Long & Winding Road

Continued on page 46

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Bossa Brazil

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Acoustic Keyboards

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Fresh Disco House 1

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Volume 21

Fresh Disco House 2

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Volume 22

Vintage Blues Guitars

Riff, arpeggios, licks, solos.

Volume 23

Historical Instruments

Harpsichord, Piano, Accordion, Celtic Harp, Violin and flute samples.

Volume 24

Industrial Loops

Industrial percussion loops and sounds.

Volume 25

Big Beat 1 - Drumloops

Loops, fills, construction kits.

Volume 26

Big Beat 2 - Samples & More

Drums, percussion, guitar & bass loops & more.

Volume 27

Reggae Ragga Dub

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Killer Brass Riffs

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Volume 31

Miro's Grooves

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Volume 32

Roots Disco

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Volume 34

Burning Grunge Hip Hop

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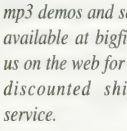

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Brand spankin' new from *Danny Ward & AMG*! All these beats were recorded using tons of drum kits, a huge variety of tunings all in different studios. With 100's of live loops, expertly programmed loops plus special conga loops, this massive collection makes this the freshest set of breaks with the most attitude!

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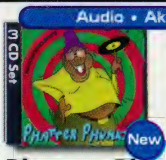

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The long awaited follow-up to Rich Mendelson's *Phat & Phunky*! This 5-star producer of *Freaky Jazzy Funky* has done it again! 3 discs-with midi files-PACKED! Construction kits, bass, drums, horns & more! "If I were an aspiring Hip Hop producer, I would sleep with *Phatter Phunkier* under my pillow." - Keyboard

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Across the war-torn landscape of modern Breakbeat dance music lies *Big Beat*! A 2-disc arsenal of the freshest, meanest, toughest sounds around- construction kits, drumloops, hits, percussion, ruff-n-tuff background noises, vocals, ambience, atmospheres & more! From 85-150 BPM! Lead your music to victory!

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Breakbeats on vinyl have been notoriously hard to get... until now. Nothing but authentic breaks- punchy kicks, crunchy snares & sizzling hi-hats. "The loops are inspiring, raw, creatively sliced & diced, greazy to lo-fi at times, and consistently good from front to back, plus there's a ton of material on board." - Keyboard

Deep-Progressive House

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Megaton House Bomb

From tech house & speed garage to deep house & nu-disco- "We dropped a bomb on you..." 2 CD's jammed with construction kits, grooves, fills, vocals, bass, keys, guitars, fx, hits & way more! "This double CD has an impressive pedigree... and if house is your thing it deserves a place near the top of your shopping list. - *Future Music*, UK

Hard Hip Hop • R&B

$99.95 Audio

Wall Of Vinyl 2

Wall of Vinyl 2 is so jam-packed with the real Hip Hop, it'll take you back to your music. No players here, just raw, pure breaks, construction kits, scratches, horns, vocoder, guitars, live drums, rhythmic FX & more! "...the best hip-hop collection we've heard. Buy it even if you don't like hip-hop!" 10 out of 10 - *Computer Music*, UK

Audio • .wav • MIDI

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Psychedelic Trance & Goa

Brand new sounds, loops & midi files for Trance & Goa! Tons of Construction kits, hi-fi drumloops, basslines, synthlines, 303 basslines, synth textures, acid patterns, vocoder loops, 808/909 hits and way more! Merge this into your production! Also available: *1-UK Garage 2-Drum&Bass 3-Big Beat & Electro*

Hip Hop • R&B • Beats

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Audio • .wav/Acid

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Vinylistics 3

Stop Searchin' The Rephlex Team has done it again! Another massive amount of stretching & bending of ol' Ruffstyle Breaks- keeping all the dust and dirt. Ruff Hip Hop and Funk Breaks with that distinguishing *Vinylistics* sound! ...and now comes with it's own .wav/Acid CD-ROM!!! Also Available: *Volumes 1 & 2*

Audio • .wav/Acid

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Audio • SampleCell • Akai

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Drum&Bass • Jungle

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260dB

Breaks, licks, bass loops, percussion, FX, atmospheres plus way more! "The loops are sharp, punchy, tight, hard and perfect for the genre. Exceptionally well recorded, these powerful loops will punch through a mix. Overall, an essential purchase for the Drum&Bass maker." - Dwart Boys Also Available: *160dB*

Akai MPC 2000

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Dave Samuels– Marimba & Vibes

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Audio • SampleCell • Akai • Kurzweil

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Over 1,500 samples from the Doctor's library. "If you're using a sampler for drums, and want to fool people into thinking they're hearing the real thing, Ross Garfield would like to talk to you. No question, the choice of instruments, the tunings, and the recording quality is awesome..." "5 out of 5" - Keyboard

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25 TECHNOLOGY MILESTONES

25 years 1975-2000

The past 25 years have been a time of giant steps — one might even say *leaps* — in technology. Think back on the state of music and audio technology in 1975, when the first issue of *Keyboard* hit the stands: Synths were analog, monophonic, and had no touch sensitivity or programmable sounds. Recorders were analog tape and editing was done with razor blades. There were no compact discs. No ADATs. No digital samplers. No personal computers. No MIDI. Home studio ownership was restricted to wealthy musicians.

Things have changed. Let's not call this the "Golden Age" quite yet — if we do, somebody writing a retrospective article 25 years from now will be pointing out how naïve and shortsighted

by Mitch Gallagher

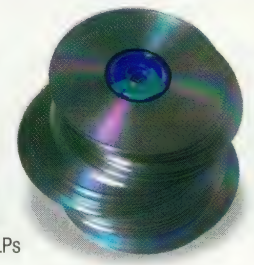
Alesis ADAT

Why it's important: First affordable digital multitrack tape recorder. Introduced the ADAT lightpipe protocol as well as the MDM (modular digital multitrack) concept.
Introduced: 1992
Original retail price: $3,995

Every once in a while a product comes along that simply changes everything in its field. The Alesis ADAT was such a product. At the time it came out, if you were working in a home studio, you were probably recording to four-track cassette. Possibly you had a Fostex R8 1/4" eight-track deck or if you were lucky, a Fostex or TASCAM 1/2" eight-track. In a pro facility, you were using large-format (1" or 2") analog machines — and paying dearly for the privilege.

The ADAT changed all that: Suddenly you could record digitally with CD quality on inexpensive S-VHS tape. No tape hiss and no generation loss. Need more tracks? Just plug another machine in and you're golden — you didn't even need an expensive and kludgey synchronizer to make it work; a simple cable hookup provided sample-accurate lock. Add a BRC remote control for $2k and you could sync and control up to 16 machines for a total of 128 tracks. The recording world reeled at the change, and bought thousands of ADATs and its descendants, the ADAT XT, LX-20, XT-20, and M20.

Compact Disc



Why it's important: First mass delivery medium for digital audio.
Introduced: 1983

Digital audio really became a buzzword in the '80s with the appearance of the compact disc in 1983. Not only was digital audio now available for mass consumption by the general public, but the need for CD content drove a huge push to get digital tools into the hands of studios and musicians — to say nothing of the incredible surge in recorded music sales as people upgraded and replaced their old LPs and cassettes with the shiny new discs.

Another chapter in the compact disc saga has unfolded over the past few years as recordable (CD-R) and rewritable (CD-RW) compact discs have become affordable for home users. For many musicians, it's now possible to create and deliver works entirely in the digital domain with sound quality that would have been impossible to achieve a decade ago — and more importantly, to do so in budget-friendly home and project studios instead of in expensive "pro" studios. The fallout from this paradigm shift remains to be seen, but there's no question that we've seen a real change in how music is made based on the availability of digital delivery media.

The Long & Winding Road

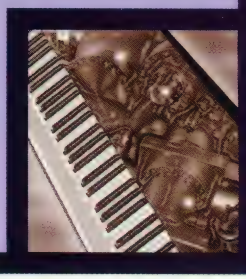
Nov. 1984 — Our first Soundpage — a bind-in vinyl record containing a short, previously unreleased solo by Bill Evans.

March 1985 — Affordable sampling for the masses arrives. The Ensoniq Mirage boasts 8-bit sound and 144K of waveform RAM for a mere $1,695 (reviewed June 1985).

July 1985 — The first installment of our Mind Over MIDI column, penned by technical editor Dominic Milano. (The column is taken over in December by Jim Cooper of J. L. Cooper Electronics; later contributors include Lachlan Westfall and Chris Meyer.)

we were back at the turn of the century. But there's no question things are very good for the keyboardist and recording musician these days. Great-sounding equipment is plentiful and reasonably affordable. Home studios have proliferated, and the means of music production have largely returned to the hands of the musician, which can only be a positive thing.

Let's take a quick trip back in time and look at some of the milestones in music technology during the past quarter-century. We'll be looking at specific products as well as important standards and concepts. We won't cover every technical advance during the past 25 years, and you may not agree with all our choices. But there's no arguing that each of these items had a significant impact on the way in which we make music today.



Digidesign Pro Tools

Why it's important: The defining multitrack DAW standard.
Introduced: 1991
Original retail price: Starting at $5,995

Pro Tools wasn't the first hard disk-based audio recorder/editor, nor even the first such product produced by Digidesign, but it has none the less emerged as the standard professional DAW (digital audio workstation). So ubiquitous is it that in many studios you'll find its name used as a verb, as in, "Let's Pro Tools those vocal tracks."

Comprising multitrack audio recording, editing, mixing, and processing environments, and expandable with a wide assortment of plug-ins, Pro Tools has evolved into a complete studio-in-a-computer. The upcoming release of version 5 software will push this evolution even further with the addition of enhanced MIDI capabilities, support for software synthesizers, and a host of new features aimed at post-production applications.

Digidesign Sound Designer

Why it's important: First computer-based sample editor.
Introduced: 1985
Original retail price: $995

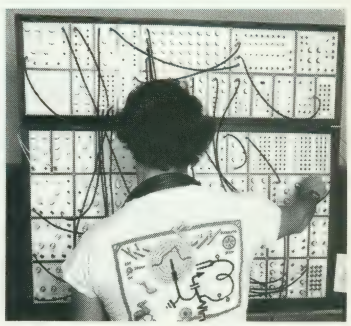
As samplers started to become available, it became apparent that there had to be a better way to edit sounds than using the tiny displays built into the keyboards and modules. Digidesign was the first to put out a computer-based sample editor, Sound Designer, which at the time was dedicated to working with E-mu's Emulator II. The program could do more than just edit sounds; it also included an Emulator II Front Panel Mode that allowed the Mac to remotely control a variety of the sampler's parameters. The program required a 512K Mac with two floppy disk drives or one of the new-fangled hard drives. (Hyperdrive had recently come out with an internal 10MB hard disk for the Mac — the equivalent of twenty-five 400K floppy disks!)

Later versions of Sound Designer supported other samplers as well. Eventually the program dropped sampler support and became a dedicated stereo audio editor/processor.

E-mu Systems Modular Synth

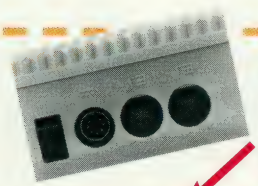
Why it's important: First digitally scanned keyboard.
Introduced: 1973
Original retail price: $1,500 and up

Aside from the fact that it was an awesome modular analog synthesizer system, the E-mu Modular had one feature that makes it historically crucial: The synth's 4060 keyboard (late '75/early '76) was microprocessor-based and digitally scanned, which made it far more reliable than the existing analog keyboards.



Originally a monophonic unit (the Model 4050, introduced in 1973), the keyboard became polyphonic in 1974. The polyphonic version also sported a built-in digital sequencer; you could even store the sequence data off to tape for recall. An 8" floppy disk drive was later added as an option.

The E-mu digitally scanned keyboard design soon found its way into the synthesizers of other manufacturers, notably Sequential Circuits and Oberheim.



Atari unveils the ST, the world's first (and so far the only) computer line to feature built-in MIDI jacks. It's quickly discovered that Atari violated the MIDI spec by putting MIDI thru on the two unused pins of the out jack.

1985

Keyboard celebrates its 10th anniversary.

October 1985

Dominic Milano is promoted to editor.

Nov. 1985

The final installment of Bob Moog's On Synthesizers column, which started with our very first issue. Bob has since contributed several Vintage Synthesizers columns, the most recent of which (Jan. 1990) was on the E-mu Modular.

April 1986

Illustration by Octavio Diaz

Fairlight Instruments CMI

Why it's important: First keyboard-based digital sampler.
Introduced: 1980
Original retail price: $25,000-$36,000

Talk about groundbreaking: When the Australian-made Fairlight hit the scene with its ability to record any sound and then allow you to play that sound back from an 88-note keyboard, a revolution was started. The original CMI (computer musical instrument) was far too expensive for most musicians, but for those with the bucks to spend, it quickly achieved legendary status.

The original CMI could record with a glorious eight bits of resolution, and provided an astounding — and amazingly expensive — one megabyte of sample RAM. Up to eight sounds could live in memory at once, and you could tweak those sounds using a QWERTY keyboard and futuristic light pen/display monitor combo.

Later models of the CMI family featured increased frequency response and bit resolution, while adding MIDI, sequencing, and even more powerful synthesis capability.

Ensoniq Mirage

Why it's important: First affordable digital sampler.
Introduced: 1985
Original retail price: $1,695

Back in 1984 and 1985, if you wanted a sampling keyboard, you had few options: The Fairlight CMI (see above) was out of reach for most mortals with its base-model entry price of $25,000. While more reasonable, the E-mu Emulator and Kurzweil 250 were still very pricey at eight and ten grand, respectively. But the good folks in Malvern, Pennsylvania, changed all that, and the face of electronic music at the same time. At $1,695 the Mirage took sampling out of the hands of the elite few and offered it up to the population at large.

The Mirage featured eight-bit floating resolution (the company claimed at the time that this provided the equivalent of a 16-bit, 96dB dynamic range) at sample rates ranging from 8kHz to 33kHz. A ten-key number pad was used to choose parameters and enter values, which were displayed on a two-digit LED readout. If a parameter or value required three digits, hexadecimal numbers were used. Not one of the high points in the history of user interface design! The Mirage also had a built-in 333-event polyphonic sequencer, a generous 144K of sample RAM, and a spacious 400K floppy disk drive for external storage.

Linn Electronics LM-1 Drum Computer

Why it's important: First programmable drum machine to feature sampled sounds.
Introduced: 1980
Original retail price: $4,995

Back in 1980, sampling was an obscure word, and drum machines were primarily considered add-ons for home organs. Then Roger Linn released his LM-1 Drum Computer. Featuring 12 eight-bit digital recordings of real drums with a sample rate of 27kHz, the LM-1 let you program your own rhythms (with a resolution of 48 ppq) instead of just using the manufacturer's preset beats — not a common feature in those analog days.

The LM-1's high price kept it out of the hands of most musicians, but it developed a loyal following among many notables, including Prince, Peter Gabriel, Herbie Hancock, and Stevie Wonder.

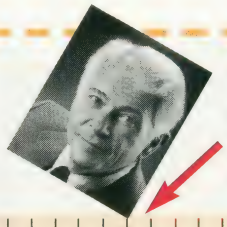
MIDI

Why it's important: Let me count the ways. . . .
Introduced: 1983

To boldly state the painfully obvious: The development of MIDI was a technological event of unparalleled magnitude for modern music. Who could have known that when Dave Smith and Chet Wood of Sequential Circuits presented their Universal Synthesizer Interface (USI) at the Fall 1981 AES show that they were laying the very rough groundwork for a specification that would have such far-reaching effects? During 1982, representatives of Sequential Circuits, Roland, Korg, Yamaha, and Kawai hammered out various MIDI drafts until a final agreement was reached. The fact that competing manufacturers could reach an agreement at *all* is an historic milestone in itself. A finished spec was released at the beginning of 1983. But not everyone offered full-on support. In his July '83 *Keyboard* article on the development of MIDI, Bob Moog states that representatives of Oberheim, Rhodes, alphaSyntauri, Buchla, E-mu, and Serge had lingering reservations about the new spec. Thankfully MIDI did achieve true standard status, and in the process changed the way many of us make music.

May 1986 — Our last (to date) cover story interview with a classical pianist — new wave virtuoso Ivo Pogorelich.

July 1986 — Freff's first Creative Options column appears.



Sept. 1986 — The final installment of Bill Irwin's long-running Pop Organ Workshop column.

Dec. 1987 — Sequential (formerly Sequential Circuits) goes out of business.

The Long & Winding Road

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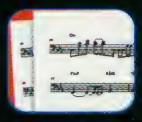
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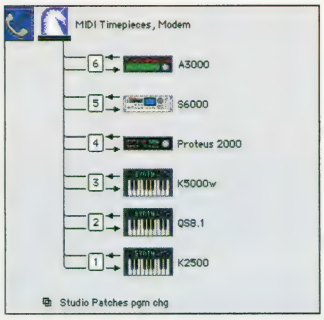


Why it's important: First successful standardized MIDI operating system.
Introduced: 1990

Once upon a time, musicians dreamed of being able to use different music programs simultaneously in a single computer. Others dreamed of those programs being able to communicate with each other. Plus, a software tool was needed to help manage increasingly complex MIDI systems. Several stabs were made at accomplishing these things, notably Apple's MIDI Manager and Intelligent Music's MIDI-Tasking System, but it wasn't until Opcode created OMS (Opcode MIDI System, and later Open Music System) that the dream approached reality.

OMS was designed to manage a MIDI rig, as well as to allow music programs to share computer serial ports. An IAC (Inter-Application Communication) driver allowed programs such as sequencers and digital audio workstations running on the same computer to synchronize and remote control one another. The success of OMS led to it being adopted as the *de facto* Macintosh MIDI operating system by many manufacturers. Recently even arch-rivals Mark of the Unicorn, who had created their own MIDI operating system, FreeMIDI, went with the flow and adopted OMS compatibility.

Opcode Studio Vision

Why it's important: First MIDI sequencer that could record and edit digital audio.
Introduced: 1990
Original retail price: $995

It seems almost mundane now, but ten years ago when Opcode began showing Studio Vision, it was, as the Jan. '91 *Keyboard* review said, "The stuff of daydreams." Built on the foundation of the company's successful Vision MIDI sequencer, Studio Vision added the capability of recording, editing, and playing tracks of digital audio to the mix. Computer-based digital audio recorders/editors had been around for a few years, but this was the first product to really attempt to integrate MIDI and audio into a musician-oriented production environment. Studio Vision supported simultaneous recording and playing of just two audio tracks, although you could have as many "virtual" or non-playing tracks loaded in a song as you liked (or could afford room for; at the time a compatible 600MB hard drive from Digidesign listed for $3,995). Basic audio editing was supported: Cut/copy/paste and strip silence were about the extent of it. Prior to the release of Studio Vision, the only real solution for integrating MIDI and audio was to sync a sequencer to an analog tape deck.

Passport Designs MIDI/4

Why it's important: First MIDI sequencer.
Introduced: 1984
Original retail price: $99

These days, it's difficult to remember a time when MIDI sequencers weren't commonplace — but in 1984, things were different. Software and personal computers were still fairly new developments, and MIDI itself was only a year old. Then Passport released MIDI/4 for the Apple IIe and Commodore 64 computers, and everything was different. "...the only MIDI music software on disk that lets you custom design your own recording studio," touted the ads appearing in *Keyboard's* June '84 issue.

The company also offered the Passport MIDI Interface for the IIe and C-64. MIDI/4 supported four independent MIDI channels, a variable drum clock for syncing up a drum machine, and support for an "unlimited number of overdubs" — as long as you stayed under the program's maximum capacity of 5,500 notes.

The program's ad copy rings familiar: "MIDI/4's incredible speed and ease of use will make you much more productive. . . ." "Unbelievable power, simplicity, and flexibility . . . at an unbeatable price." We could swear we read a sequencer ad saying about the same thing just the other day — maybe things *aren't* all that different.

Personal Computers

Why they're important: The essential tool for the modern studio.
Introduced: Early '80s

No news here: The advent of the affordable personal computer has been one of the most significant technological advances in history. In the music world, it's changed the way we approach just about every aspect of music making, from ear training to multitrack recording. A number of companies and models have come and gone, starting with the Apple II, Commodore 64, Atari ST series, and Commodore Amiga series, as well as musician-oriented models such as the Yamaha CX5M. The Atari, in particular, made a strong bid for music supremacy in the mid-'80s with its built-in MIDI ports. But these days the platform war smoke has largely cleared, and the Apple Macintosh and Windows-based PC have emerged as the reigning standards. The personal computer story is far from over, though; operating systems continue to appear and evolve, and it's a sure bet that computers and how they're used in music and audio will continue to grow and change for a long time to come.

The Long & Winding Road

March 1988 — GPI (our original parent company) is sold by founder Bud Eastman, and *Keyboard* is identified on the masthead as part of "A DALTON COMMUNICATIONS COMPANY."

Sept. 1989 — *Keyboard* is sold to Miller Freeman, and the September masthead features the Miller Freeman board of directors for the first time.

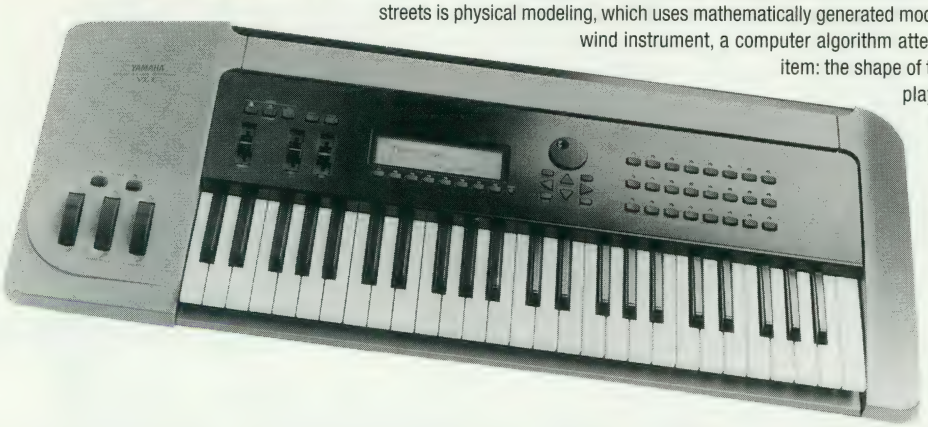
Dec. 1989 — After more than 14 years, contemporary classical piano specialist David Burge (not, please, to be confused with perfect pitchman David L. Burge) writes his final monthly installment of Contemporary Piano for us.

February 1990 — Bud Eastman, founder of *Guitar Player* and *Keyboard*, dies.

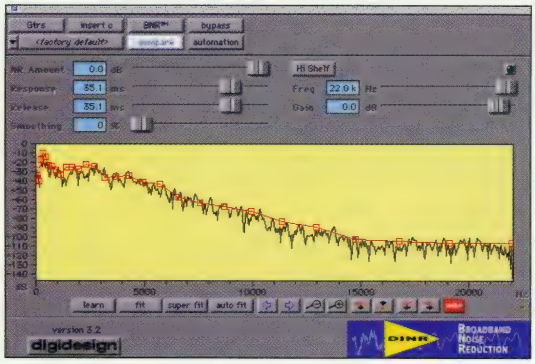
Physical Modeling

Why it's important: Powerful new form of synthesis and audio processing.
Introduced: Mid-'90s

Over the years, a number of synthesis techniques have emerged: analog, FM, sample playback, wavetable, additive, and so on. The most recent to hit the streets is physical modeling, which uses mathematically generated models to synthesize sounds. For example, in synthesizing a woodwind instrument, a computer algorithm attempts to reproduce the behavior of the various aspects of the item: the shape of the mouthpiece, the length of the air column, the effects of the player's embouchure, and so on. Doing this well results in a remarkably accurate reproduction of the instrument tone that's not plagued by the static nature of samples.



In 1994, Yamaha introduced one of the first modeled synths, the VL-1, which covered a variety of acoustic instruments. Clavia was close behind with their Nord Lead (1995), which modeled analog synthesizers. Since then a number of manufacturers have entered the fray. Physical modeling is being used to reach beyond synthesis into areas such as modeled guitar amplifiers, acoustic spaces, vintage effects processors, and more. Expect this technology to become even more important in the future.



Plug-ins

Why it's important: Produced an important shift from hardware-based processing toward entirely computer-based music production.
Introduced: Mid-'90s

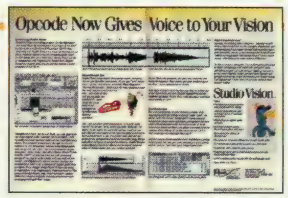
The increasing dominance of personal computers and digital audio workstations/sequencers in the music production scene has led to a change in the way musicians make music: In many home and project studios, there's not a lot of outboard processing gear (compressors, gates, equalizers, etc.). Rather, software plug-ins — small programs that work inside a host program and extend its capabilities — are being used more and more commonly. Audio plug-ins began to appear in 1994; Digidesign's DINR noise reduction, Jupiter Systems' (later Antares Audio Technology) MDT compressor, and Waves' Q10 equalizer, all for Digidesign's Sound Tools system, were among the first. Since then, the list of available plug-ins has grown immensely (as, unfortunately, has the number of competing plug-in host formats). You can now get plug-ins that emulate synths and vintage processors, replace external hardware, or twist audio in all kinds of new and radical ways. Some require dedicated hardware DSP (digital signal processing) power, while others are able to run "native" on the computer's own processor.

Roland D-20

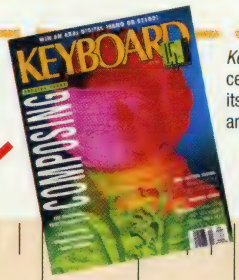
Why it's important: First true workstation keyboard.
Introduced: 1988
Original retail price: $1,795

The *Keyboard Unabridged Dictionary* defines a true workstation as a keyboard in which you can create a finished piece of music. It must have sequencing, sounds, effects, mixing, and storage to inexpensive portable media. By that criterion, the little-known Roland D-20 was the world's first workstation. Contemporaries of the D-20, such as the Ensoniq SQ-80 and Korg M1, come close, but the M1 had no disk drive and the SQ-80 had no effects. With its eight-part multitimbrality, eight-track sequencer, synth sounds, sampled drums, 32-note polyphony, digital reverb, and built-in disk drive, the D-20 gets the nod.

Descended from the company's popular D-50 synthesizer, the D-20 was part of the second generation of LA (Linear Arithmatic) synthesis-based products from Roland. While the rest of the D line never achieved the fame and success of the original, they did push forward the workstation concept and help improve the price-performance ratio of the day.



Late **1990**: Opcode releases Studio Vision, the world's first integrated MIDI sequencer/hard disk recorder (reviewed Jan. 1991).



October **1990**: *Keyboard* celebrates its 15th anniversary.

January **1993**: A record-breaker — our hottest selling issue to date in terms of the percentage of copies sold. Cover artist: Bart Simpson (the cover story is on the making of the music and sound effects for *The Simpsons*).

Roland TR-808, TR-909, & TB-303

Why they're important: After-the-fact analog drum and bass synth stars.
Introduced: TR-808, 1980; TR-909, 1983; TB-303, 1982
Original retail prices: TR-808, $1,195; TR-909, $1,195; TB-303, $395

Hybrid drum machines that featured microprocessor-controlled analog sound-generating circuitry, the 808 and 909 faced stiff competition from the Linn LM-1 (see page 48). In fact, the 909 had sampled hi-hat, crash, and ride cymbal sounds that were intended to help it compete better. But the Linn proved too tough to battle, and the machines were quickly discontinued and fell from favor.

The TB-303 was a primitive monophonic analog synthesizer/sequencer intended to provide bass lines. Roland had designed it so that it could lock up with a TR-series drum machine and provide synchronized bass and drums accompaniment. People were not impressed, and the TB-303 vanished into obscurity.

But not for long; a few years later rap, hip-hop, and techno artists rediscovered these machines, and a new sound was born. Suddenly the vintage models were worth a fortune, and software and hardware clones of the 808, 909, and 303 were being released by a number of manufacturers. Considered essential for most dance/electronica styles, these machines have left an indelible imprint on music.

Sequential Circuits Prophet-5

Why it's important: The first completely programmable polyphonic synthesizer.
Introduced: 1978
Original retail price: $3,995-$4,495

If you were a pro keyboardist in 1979 or 1980, you *had* to own a Prophet-5. It was the first polyphonic synth in which every parameter could be stored and recalled. The Prophet was actually an analog/digital hybrid, with five-note polyphony and a classic Minimoog-type voice architecture. Forty user presets could be stored in its computer memory. Later models had 120 presets as well as a cassette interface for backing up the memory. The last versions released (Rev 3.2 and 3.3) could be MIDIed.

Software Synths & Samplers

Why they're important: The final components necessary for shifting music production from hardware entirely to software.
Introduced: Mid-late '90s

In recent years, more and more of our audio and music production tools have migrated from external hardware formats to far more economical and efficient computer-based software versions. It's only natural, then, that synths and samplers should do the same. After all, most synth/sampling hardware is digitally based, and digital number crunching is what computers are best at. Plus when you're finished playing with your synthesizer software, you can use the PC to cruise the Internet for nude photos of your favorite TV/movie star — try that with your DX7.

Numerous software synths and samplers have hit the market in the past three years. Among the first and most successful was Propellerheads' ReBirth RB-338, a software re-creation of Roland's TR-808, -909, and TB-303. Another early contender was Seer Systems' Reality, a synthesizer emulation package. At this point, the technology is still young. But with companies such as BitHeadz, Koblo, Native Instruments, NemeSys, and others pushing the development envelope, software synths and samplers are sure to progress by leaps and bounds.

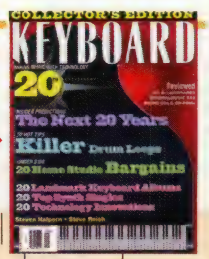
The Long & Winding Road

Dominic announces the birth of our website. After explaining what the World Wide Web is, he recommends state-of-the-art Web browser Mosaic.
January 1995

After a few years in Hollywood and a stint as managing editor, founding editor Tom Darter returns and is re-promoted to the editor's chair.
March 1995

Stevie Wonder finally appears on the cover, even though he fell asleep during his interview with Bob Doerschuk.
July 1995

Sept. 1995



Keyboard celebrates its 20th anniversary.

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TEAC/TASCAM Porta-Studio 144

Why it's important: Made home/portable studio-in-a-box multitrack recording available to the masses at an affordable price.
Introduced: 1979
Original retail price: $1,100

The TEAC/TASCAM Porta-Studio was one of the first products to make multitrack recording and mixing easy and affordable for musicians. Offering four tracks of recording on cassette tape and providing a four-in/two-out mixer, the Porta-Studio 144 was an early example of TEAC's approach. The unit ran tape at double speed (3-3/4" per second) for better sound quality, and used Dolby noise reduction for improved signal-to-noise. The 144's mixer had four mic or line inputs, individual bass and treble EQ on each channel, a stereo aux/effects return, and four VU meters.

Porta-Studios were the staple of many home studios until the advent of the Alesis ADAT. The line was so successful that the word "portastudio" assumed almost generic status, and was commonly used by musicians to refer to all self-contained multitrack recorders/mixers regardless of who manufactured them.

Sony Digital Audio Technology

Why it's important: Major contributions to advancement of digital audio recording.
Introduced: Late '70s/early '80s

Sony made numerous contributions to the digital audio revolution. They were one of the first to provide tools for mastering to digital formats with their PCM-1600, -1610 (1981), and -1630 (1985). The latter became a standard for CD mastering. In the pre-DAT era, these were very important units. All three worked by encoding the digital audio into a format that could be recorded onto a U-Matic video machine.

Around 1982 (still in the pre-DAT era) Sony introduced the PCM-F1, which was originally intended as a consumer piece. It could encode digital audio and record it to Beta or VHS format video recorders. The F1 became quite popular among musicians and studios as a digital mixdown and mastering medium. Sony followed the PCM-F1 with the PCM-501 and PCM-601, which were similar. The arrival of DAT finally signaled the demise of this equipment, but it had a big impact on the recording industry during its short life span.

Sony has made other contributions to digital audio progress: On the high end, they pushed the digital multitrack recorder envelope with DASH format machines such as the PCM-3324 (introduced in 1981). And, probably most important of all, Sony (along with Philips) developed the compact disc (see page 46).

Yamaha CS-80

Why it's important: A front-runner in analog synth polyphony, velocity-sensitive keyboards, polyphonic aftertouch, and microprocessor control.
Introduced: 1976
Original retail price: $6,900

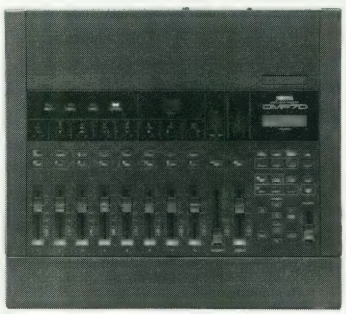
The Yamaha CS-80 can't necessarily claim to be first at many things, but it was an important synth because it drew together so many then-innovative features into one neat, slightly-more-than-compact 220-pound package. The CS-80 was one of the first analog synths to offer polyphony, one of the first with a velocity-sensitive keyboard, and the first production synth with polyphonic aftertouch. The CS-80 was also microprocessor-controlled, and you could save and recall a couple of user presets — not a common feature in those days.

Most users (and probably even more so their techs) had a love-hate relationship with the CS-80. It could be a temperamental beast, nearly impossible to tune, and a royal pain to transport, but it also provided distinctive tones and, for players accustomed to synths of the day, featured unheard-of touch and responsiveness.

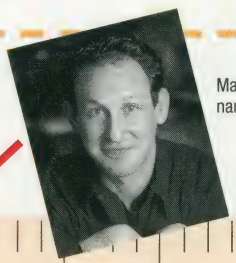
Yamaha DMP7

Why it's important: First affordable digital mixer.
Introduced: 1987
Original retail price: $3,995

Back in 1987, if you wanted a mixer, you could have any type you wanted, as long as it was analog (to paraphrase Henry Ford). The DMP7 changed all that, bringing digital mixing capabilities to the fore and providing some nice extras at the same time. The DMP7 was an eight-in/two-out mixer with three internal effects sends and returns. Two of those were internally routed to the equivalent of Yamaha's SPX90 processors — one of the hot digital effects boxes of the day. The third could access ➥



Bob Doerschuk leaves *Keyboard* to become editor of *Musician*.



Marvin Sanders named editor.

Greg Rule named editor.

October 1995 — Dec. 1997 — January 2000

The Long & Winding Road

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—Keyboard Magazine, June, 1999

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—Roger Joseph Manning Jr. (Beck, Jellyfish)

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Distributed by DR Music. (201)-599-0100. http://www.VoceInc.com

KEY INFO #160

another internal effect (equivalent to about half of an SPX90) or could be routed to an external mono send and stereo return. Each channel had three-band parametric digital EQ, as well as level, mute, solo, and pan controls.

Automation was available in two forms: The DMP7 could store 30 "snapshots" of its controls and crossfade between them, or 206 of its parameters could be automated using MIDI controller and note messages. It even had motorized faders.

One thing the DMP7 didn't have: digital connectivity. And for good reason: At the time, there was very little gear available that had digital I/O. The only digital connection on the mixer was a bus port for cascading multiple DMP7s together for more input channels.

Yamaha DX7

Why it's important: One of the most popular synths and most identifiable sounds ever.
Introduced: 1983
Original retail price: $1,995

The DX7 wasn't the first synthesizer to feature FM synthesis — nor was it the first digital synth from Yamaha. But it was one of the most successful synthesizers to date, both in terms of numbers sold and in the dominance of its sound. There was a time in the mid-'80s where you almost couldn't escape the chime of DX-style electric pianos and bells — it seemed as if every recording used them. The DX also offered the most polyphony yet seen in a programmable synth (16 notes) and was an early example of a synth with integral, if somewhat limited, MIDI support: You could only transmit on MIDI channel 1, and it didn't support the full range of MIDI note velocities. However, the fact that it had velocity sensitivity at all was a major point in its favor.

Programming the DX7 was a real "brain-bender," as *Keyboard* put it in the Oct. '83 issue. Because of this, a new entrepreneurial opportunity for tech-minded musicians was born: the professional synth programmer.

Yamaha R1000

Why it's important: Early affordable digital reverb.
Introduced: 1984
Original retail price: $795

Prior to 1984, "low-cost digital reverb" was an oxymoron — if you wanted digital reverb, you either rented time at a well-equipped pro studio or laid out $12,000 for a Lexicon 224XL. But as with all things based on technology, the price of admission soon dropped into the affordable range. At $795, the Yamaha R1000 was downright cheap compared to the competition — the next closest competitor was Lexicon's $1,495 PCM 60, which was announced later in 1984.

The R1000 was a 1U rackmount processor; it offered four fixed preset reverb times and a three-band semi-parametric equalizer. As a bonus, the unit had an external effects loop, which allowed delays and other effects to be plugged into the R1000's signal path. ■

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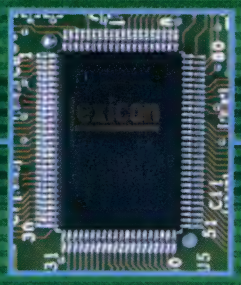

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25 YEARS OF WEIRD GEAR

Step right up, young and old, and feast your eyes on some of the strangest instruments and rigs ever seen in the pages of *Keyboard*. Marvel at the tattooed synth, the throat-to-MIDI converter, and [*gasp*] the cavalcade of homemade modulars.

Most of the items in this article were culled from previous "Keyboard of the Month" columns — our monthly spotlight on custom and/or oddball equipment. But if this piece isn't enough to quench your morbid thirst, be sure to check out Ted Greenwald's two-part "Tarpits of Technology" feature (Dec. '86 and Feb. '87) and Bob Moog's "Traveling Show of Electronic Controllers" (March '93).

by Greg Rule

JOYSTICK

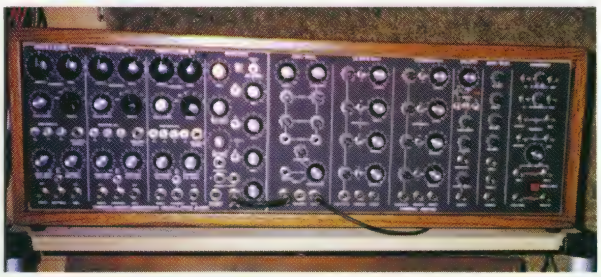
That's Corey Pryor of the Christian dance-pop group Sozo on his spring-loaded keyboard stand. "It's like being on a bucking bull," he laughs. "You jump on it, bend it around back and forth, and try to play chords at the same time. It's not easy. I've always done crazy things onstage. I used to wear a jet pack, I had fireworks coming out of my keyboards, stupid things. But I think it's important to entertain people."

STALACPIPE ORGAN

Built by Leland W. Sprinkle, the Great Stalacpipe Organ resides in North Virginia's Luray Caverns. It's cool enough that the organ is underground, but what really sets it apart are its stalactite "pipes." Pressing any key on the four-manual console triggers a solenoid-driven mallet that's mounted next to a tonally corresponding stalactite. The ensuing resonance is captured by a pickup and sent to a P.A. system. Solid!

PROPHET/MOOG

Supertech Mike Metz took leftover components from a Minimoog and Prophet-5 and performed some creative gene-splicing. The result is a hybrid synth "that sounds stunning," says Mike. "It has the big, fat Moog oscillator sound with the bright, sharp clarity of the Prophet filtering and envelope generators." Mike can be emailed at rocdoc@hotbot.com.



MISSING LYNC

Let airbrush expert Marcel Franklin loose in a room with a Lync and this is what you'll get. Lync owner Scott Yahney explains, "I like to be up and free at my gigs, and I wanted to do something totally different." To that end, Yahney contacted Marcel, sent him the keyboard, "and told him to go crazy on the colors." Did he ever. Great job, Marcel.

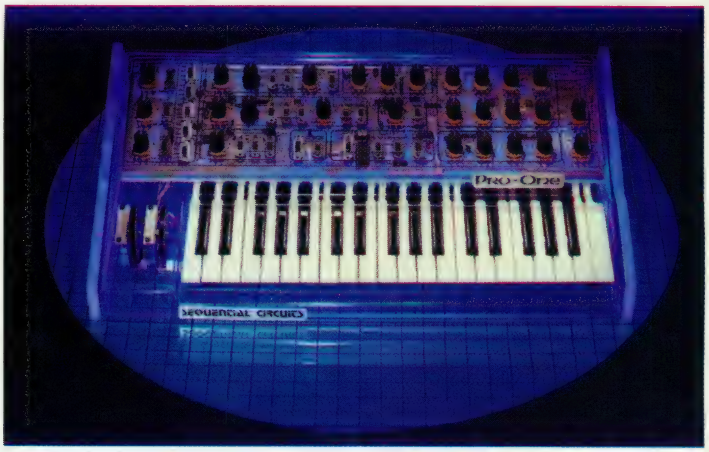
Illustration by Octavio Diaz

MONSTER MODULAR

We've seen our share of homemade modular synths over the years, but few have impressed us as much as this one — a 170-module (!) beast built by Joe Paradiso. Components include "voltage-controlled chaos generators, pseudo-random sequencers, and triggerable/programmable phoneme synthesizers with phase-locked loop trackers," to name a few.

SEE-THROUGH-QUENTIAL

This clear Sequential Pro-One was one of the most buzzed-about products at the '83 NAMM show. Too bad it wasn't a functioning synth; it was for looks only. Former *Keyboard* staffer and Sequential employee Greg Armbruster recalls, "We put it on a pedestal near the aisle, with a light shining through it. People started coming into the booth asking where they could get one. Oops! I spent a lot of time at that trade show explaining that it was just for the booth."



CURVED SERGE

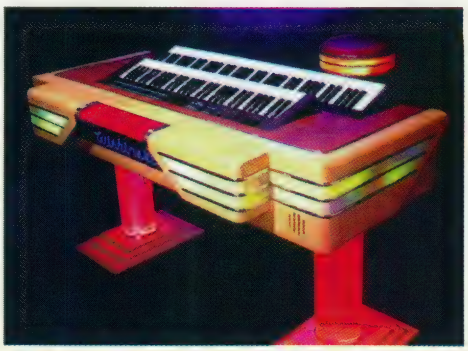
Edmund Eagan of Ottawa, Ontario, deserves a standing ovation for this sleek Serge rack. He created the concave beauty using salvaged Ultimate Support and Tubecraft parts. We don't know what's more exciting, the rack or what's in it. Awesome, Edmund.

RED DEVIL

"My homebrew polyphonic synth was designed in 1973," says creator/mad scientist David Laude, "but construction continues with the addition of the trigger pulse processing module, seen here undergoing testing on the right side of the keyboard." And don't overlook the jewel in this modular's crown: the red lightbulb on top. *Roxanne. . . .*

ROCK-O-TRON

One of the most eye-catching synth setups we've seen, the "Rock-O-Tron" was built by Doug Fraser and Bob Wishinski of New Westminster, B.C. "It's constructed of wood and Plexiglas, and sports a three-channel color organ that controls over 100 Christmas lights concealed behind the Plexi panels," says Bob. "The legs are 6" Plexi cylinders filled with bubbling water. There were goldfish in there for a while, but they were a bit of a hassle on the road."

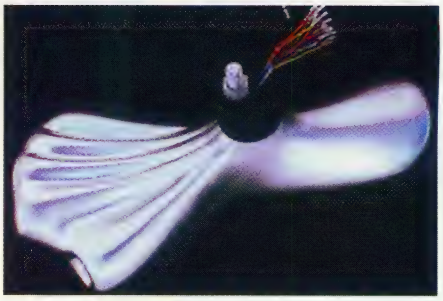


ROBO-GLOVE

Looking more like a prop from the set of *Star Trek* than a musical instrument, this freaky controller is the brainchild of Tom Suaboszevsky. "The idea of a more human, ergonomic interface between computer or keyboards gives many benefits," says Tom. "You don't need to move your hands, only your fingers. Pitchbends are controlled by thumbs. Also, unlike conventional keyboards, this does not cause pain or injuries."

LENNY'S B

Is it a diner booth or a B-3? A little of both, actually. This retro beauty is the property of Lenny Kravitz, and has been making the rounds on his "Freedom" tour. "We had Al Goff take it apart and rebuild the inside," says keyboard tech Mark Browne. "It was Lenny's idea to do the tuck 'n' roll, so I sent the case to an upholsterer in Jersey. Then it went to Tait Towers, who built the stand for it." George Laks has the enviable task of playing Big Red on the road.



PHATTYTRON

Below is the original Phattytron tube synthesizer . . . that's right, vacuum tubes. Eric Barbour of Metasonix built this prototype in 1996, and it spawned a subsequent line of Phattytron rackmount synth modules. Why tubes? "There's a whole universe that has never been explored," said Barbour in 1997. "For instance, if you modulate the beam-deflector tube [used in the Phattytron], you can do strange things with it. Its distortion is quite unlike anything you can do with a chip." For more info, visit the Metasonix site at www.metasonix.com.

THE WOODY

That's James Ingram showing off his one-of-a-kind DX7. Philadelphia artisan Anthony DeMelas encased the classic synth in a twisted array of raw and milled woods. According to Yamaha, who unveiled the instrument at the 1996 NAMM show, the piece was commissioned by Aaron Wyatt, a friend and business associate of James Ingram's, after the two reminisced about the DX7's impact on Ingram's early music career.

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ANTI-GRAVITY STAND

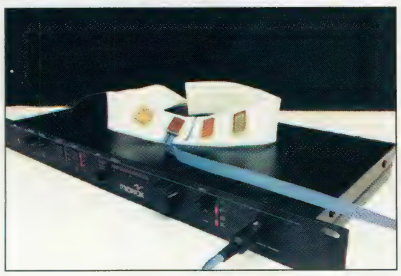
Doug Firley of the band Gravity Kills might live up to the band's name on this custom-made metal stand. Actually, calling it a stand is an understatement. The industrial-strength apparatus swings, swivels, and bends into bizarre contortions. "Previously I had A-frame and Apex stands," says Firley, "and I thought, 'Man, there must be something else out there.' My first idea was to get something I could jump on, like a table or something. I was talking to [bandmate] Kurt, who's also an architect, and he said, 'That's an idea, but what about an H.R. Geiger-like steel frame that could turn or whatnot?' So he came up with a rough idea, and then he brought in Mike Linenbroker — an architecture friend from school." Mike built the beast, and you know the rest.

WHAMMY CLAV

If you think whammy bars are only for guitarists, think again. This custom Clav belongs to one-time *Keyboard* columnist Steve De Furia. "It started out as a standard D6 purchased around 1979," he explains. "The whammy modification was done by Buddy Castle in the early '80s. It's essentially a gigantic Bigsby Tremolo with two main elements: a floating bridge and the whammy bar. The throw of the bar is about 12 inches." The unit also sports a row of oversized single coil pickups. Rockin'!

DOG COLLAR

Ruff, ruff. . . . Behold the MidiVox, a throat-worn radar-type device that translates vocal cord movements into MIDI data. Yes, you heard right: not audio-to-MIDI but vocal cord movements-to-MIDI. (Perhaps the only controller more bizarre was that brain waves-to-MIDI thing we saw demoed at NAMM a few years ago.) The MidiVox entered and exited the market pretty quickly, most likely due to its lofty $1,599 price tag, but heck, we had loads of fun with it back in '92 when it came in for review.



THE ORBITER

This double-neck remote was conceived and constructed by Victor Cerullo of Italy. The unit is equipped with six assignable modulation controllers (two knobs, two wheels, rotating drum and ribbon) and a built-in wireless MIDI transmitter. (If this isn't enough strap-on excitement, check out the Golden and Purple Axes built for The Artist, pictured on page 36 of our Dec. '99 issue.)

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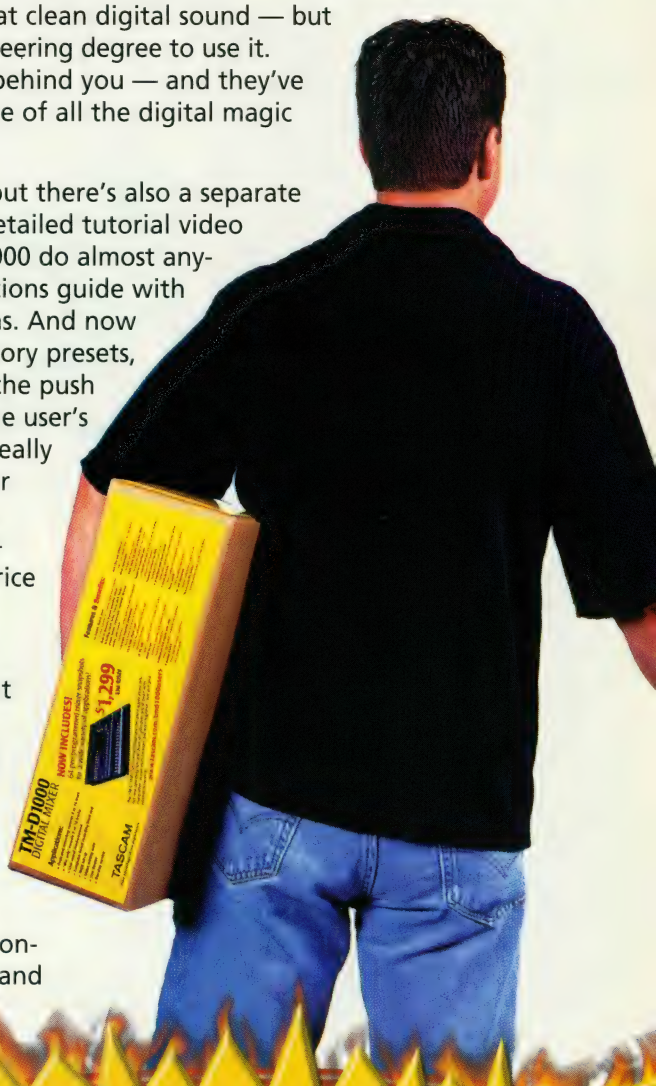

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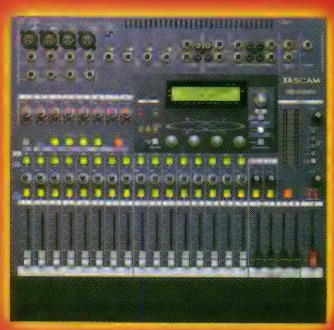

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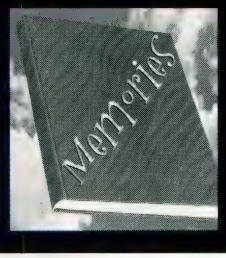
THE KEYBOARD DIARIES

In the 25 years of *Keyboard*'s existence, an army of editors has kicked, prodded, and poked the magazine into the product it is today. Along the way, many of us crossed paths with greats, and traveled to far-away places in search of the elusive scoop. We've witnessed some extraordinary events in the process — as you're about to read. GREG RULE



ROBERT L. DOERSCHUK

It was early afternoon, a brilliant but frigid day. Here, in the heart of Moscow, in the coldest winter recorded since people started keeping track of the temperature in Russia, the streets were canals of dirty snow, the ancient storefronts bleak testaments to the breakdown of a discredited way of life. My translators and I tromped through the slush until we found the right address. Naturally, the elevator wasn't working, so we climbed four or five stories, past peeling paint walls lit dimly by the occasional yellow bulb. Finally we made it to the flat we had come to visit.

This was just one of many stops on my trip to Moscow and Leningrad in 1987, on assignment from *Keyboard* to write about music in the Soviet Union. I was maybe halfway through my ten days there, but already I understood that doing business as a journalist during those infant days of glasnost involved endless inconveniences, both logistical and bureaucratic. Moments of real human contact and, of course, stunning music often cropped up as well, but not enough to keep me from feeling exhausted already. How would I make it through another five days of climbing stairs, trying to reason with indifferent Novosti Press officials, and begging taxi drivers to give me a lift even at extortionate rates?

At this point, I had no idea who I was being taken to meet. It was, I had been assured, something of a surprise. We knocked on the door. After a few seconds, I was eye-to-eye with a somber guy in his mid-20s. He wore a black robe; beneath its cowl, I could see that his head was shaved. Without a word, he swung the door open, stepped aside, and ushered me into his apartment. Inside, the walls and windows were covered with tinfoil — whether it was to block out some sort of evil radiation or just create an ominous, insular space, I couldn't tell. I sat on the one piece of furniture in the room, a ratty old couch shoved against a wall. On the wood floor, which was painted white, lay a scattering of noisemakers: one or two low-budget keyboards, assorted percussion instruments, one large gong, and a bunch of home-built electronic devices. My host nodded at two colleagues, who also wore black. Silently, slowly, they took their places. After a moment, with another nod, the music began.

For the next 20 minutes, I listened as the trio improvised an electronic fantasia. Imagine, to begin with, three Rasputins poking into the darkest corners of new age spaciness. From there, they built an increasingly dissonant crescendo, clangorous in texture, yet more emotionally compelling than most of what I had heard from America's relatively jaded avant-garde.

In this cell-like space, with the foil reflecting the room's bald light, with the cramped space growing more tight and confined, on tools rigged from junk that few Western consumers would waste a glance on, something compelling and unexpected unfolded before me, an audience of one. Eventually came the climax, a screeching finale capped by a ponderous crash on the gong. The sound slowly died away, and once again we sat in silence. Then my host rose, walked deliberately to the window, and raised the glass. Light exploded into the room. He motioned for me to have a look, and there, just a block away, beneath a deep azure sky, the domes and spires of the Kremlin shone in spectacular gold behind the ancient brick walls. When we left a few minutes later, still no word had been spoken. But that afternoon, far from my desk back in California, stays with me more vividly than many of the interviews I did through my 17 years with *Keyboard*, as an embodiment of the drama inherent in making and experiencing music.

GREG RULE

I've seen some pretty spectacular things in my nine-plus years of working for *Keyboard*. In recording studios, on concert stages, in hotel rooms, restaurants, and bars, celebrity artists have given me and my trusty old Sony tape recorder more than a mouthful. And just when I thought nothing would top my whirlwind day in San Francisco with **Tori Amos** in 1992 or the unforgettable hangs on the sets of *The Simpsons* and *The X-Files*, along came **Marilyn Manson** in 1995, and an invite to interview Marilyn's keyboardist **Madonna Wayne Gacy**. At

Top illustration by Octavio Diaz, story illustrations by Richard Leeds

first I was hesitant to take a day off during deadline week, so I requested a phone interview. But the publicist was adamant that I hook up with the band in person. "Trust me," she urged. "You won't regret it."

After a couple of arm twists, I accepted her offer. Here's what I wrote the next day:

"I'm on a tour bus, face to face with Madonna Wayne Gacy. He's creepy, very creepy: bald head, piercing eyes, chicken claw dangling from his neck, braided goatee, black leather pants, studded wristbands. We're talking Freddie Kreuger/Anton LaVey-grade material here.

"It gets weirder. As if interviewing a Lucifer look-alike isn't bizarre enough, two *Hustler* centerfold types enter the bus wearing little more than a smile. They're greeted by Marilyn Manson, singer of the band, who looks like he's just been nailed to the cross — ghostly white, thin as a stick, and covered with what appears to be fresh scars and fake blood. A team of cameramen and a director are in tow, and what happens next is about what you'd expect to happen on a tour bus between a lead singer of decidedly demented appearance and a pair of women who have just stripped off everything but their spike heels."

Needless to say, the ensuing anticts weren't publishable in the pages of *Keyboard*, but if you have an overactive imagination, let it run wild. (And if that imagination includes having a live porn show erupt mere feet from your interview, then you wouldn't be far off the mark.)

And to think I almost settled for a phone interview. . . .

DOMINIC MILANO

I don't have any stories that come close to being as interesting as Greg's encounter with Marilyn Manson, though there was one incident that convinced me the life of a musician on the road isn't as glamorous as it looks.

It was some time in the mid-'70s. I was sitting in a coffee shop, waiting to interview a famous guy whom I'll refer to as FG. When FG appeared, I got that butterflies-in-the-stomach zing you get when a moment you've been waiting for finally arrives. But as FG walked over to the table, I could tell something was wrong. FG was moving as if he were in some serious discomfort. As FG took a seat, he muttered, "Don't tell my wife, but I caught the clap from some groupie."

This one's a little less colorful, but it's one of those moments that I'll never forget.

It was 1979. I was both an assistant editor and the magazine's art director. We'd just started working on the December issue and it was early enough in the production cycle that I'd been sent to New York to spend a couple of days doing our first-ever interview with synthesizer pioneer **Wendy Carlos**. Wendy is a night person, but I arrived mid-morning. While waiting for her to awaken, I sat alone in her studio listening to *Sonic Seasonings* and the sketches of Wendy's ill-fated score to Stanley Kubrick's version of Steven King's *The Shining*. I also spent some time interviewing Rachael Elkind, who at that time was Wendy's producer and collaborator.

Anyway, it was late afternoon before Wendy and I got started with our interview, but we talked through the night. In fact, I had at least six or eight hours on tape when a call came for me. It was *Keyboard* Central Command, a.k.a. editor Tom Darter, calling to tell me that the December cover story had just fallen through and that the interview I was conducting was being bumped up to fill the hole.

Undaunted, Wendy and I finished our two-day session and I high-tailed it home with some 12 hours of interview on tape to transcribe, a few rolls of film to develop, and a ton of stuff Wendy had given me to illustrate her techniques.

The nightmare came when I arrived at the office and handed off the tapes to the entire staff, who had dropped everything to pitch in with transcribing hours and hours of material filled with electronic music jargon. In 1979, we were still using typewriters; the closest thing we had to a word processor back then was our resident typesetter. So when my fellow *Keyboard* Chain Gangers couldn't hear what Wendy or I had said. . . . Wendy speaks very quietly, as do I, and we were talking even more softly than usual so as not to wake the other people in the house. Most of the tapes were inaudible to everyone but me. So I ended up camping out for a week, cleaning up those transcriptions, and writing the story on a couple hours' sleep per day.

I don't remember how long the actual transcript was, but the final version of the story ended up being something like 100 typed pages. To this day, it is either *the* longest story or one of the longest stories we ever published. It just about killed all of us. I'm not sure, but I think the cover story that fell through was one of many **Stevie Wonder** interviews that we'd been promised but that never happened. I've lost count of how many times we sent someone to an interview, only to have Steveland not show up.

Personal recollection: Some January NAMM show in Anaheim, California, Bob Doerschuk and I sitting in a hotel room, calling into the studio Stevie had booked, and being told to call back because "Stevie's due within the hour." We waited through the night, hoping to hear he'd arrived and that we should drive over. Of course, that never happened. Apparently, Wonder has a reputation for having no concept of distance.

One story: He had a bunch of first-call LA studio musicians booked for a session. Wonder called to apologize for being delayed and said he'd be there soon. Someone asked him where he was and he answered, Zimbabwe.

Coulda, woulda, shoulda moment: I'd heard that the author of one of my favorite comic strips was a *Keyboard* reader, so I asked assistant editor Kyle Kevorkian to look into whether he would be interested in doing a comic strip specifically for *Keyboard*. After a bit of footwork, Kyle reported that he was interested, but he required 7.5 column inches for his strip. The fee was something insanely affordable, but I didn't think readers were ready for a half-page comic strip, so I nixed the idea. It wasn't long before *The Simpsons* came out, and I've always regretted not going ahead with a comic strip by **Matt Groening**, the creator of the longest running (and IMHO the funniest) animated show on TV.

An "I must be dreaming" experience: It was 1978. My wife and I were vacationing in London, staying with friends Bob Styles and Anne Perslow. At the time, Bob was the manager of Rod Argent's Keyboards, a music shop on London's Denmark Street. One morning, Bob insisted that we stop in the shop before going off to play tourists. Upon entering the shop, we were greeted by just about every famous keyboard player who happened to be in London that day: **Rod Argent, Robin Lumley, Hans Zimmer, Patrick**

Moraz, Christopher Franke, Dave Stewart, and probably a dozen more. The place was packed with incredible players. At one point, someone handed me a phone. It was **Oscar Peterson** apologizing for not being able to stop by! Talk about feeling like I'd stepped into some alternate reality.

JIM AIKIN

One of the great things about working at *Keyboard* is that from time to time you get to meet world-class musicians whom you admire, and whose work you respect. Over the years I've encountered a number of these folks. One or two I'm proud to consider friends. A couple of others stand out because I felt truly privileged to meet them. And then there were the notable guitarists I got to play bass with, if only for a few songs. It happened this way:

For a while, when *Keyboard* and *Guitar Player* were still part of a small, independently owned publishing outfit, we had monthly jam sessions in the warehouse/mail room. These were not world-class jams. Presided over by publisher Jim Crockett on drums, they mostly consisted of interminable choruses of 12-bar blues, at various tempos and in three or four guitar-friendly keys. Since Jim no longer touched his drumsticks except at the jams, he was a little rustier than some of the employees, who were actually gigging in local clubs from time to time.

But at least Jim had been a pro. We also had employees whose idea of jamming was to plug in and play whatever they thought of, with seemingly no concept of whether anybody else was soloing at the time. One of them, who shall remain nameless, noodled away endlessly on electric mandolin, imparting an irritating high-pitched shimmer to every tune, rather as if the band were torturing a metal chipmunk.

Jim was always looking for ways to promote the magazines. And part of his schtick was that these magazines were actually written by musicians, for musicians. Which was true enough. At some point, somebody got the bright idea that it would be a Media Moment if we could get, say, **Jerry Garcia** or **B. B. King** to "drop by for a jam session," complete with photo op and local TV news coverage.

The whole thing was a put-up job. Jerry Garcia was not in the habit of hanging around at *Guitar Player* hoping for a chance to play 12-bar blues with an ex-jazz drummer turned magazine publisher and yours truly on bass. But he did show up once, as did B. B. King. **Tom Coster** (ex-Santana) came by two or three times and played some burning keys — but Tom wrote a monthly column for *Keyboard*, and lived only a few miles away. He did it because he's a heck of a nice guy, not because he was angling for publicity.

From time to time, other artists have dropped by just to say "howdy." **Keith Emerson** showed up once. Very friendly and low-key. Never having been an ELP fan, though, I wasn't knocked out. Only once have I been as truly thrilled as any fan to meet one of my idols.

I don't remember the date. It was the mid-'80s. At the time, *Keyboard* and *Guitar Player* had a sister magazine called *Frets*, which covered acoustic stringed instruments. At some point, *Frets* did a cover story interview with **Pete Seeger**. Shortly after the story was published, Seeger himself dropped by the *Frets* office to say, "Thank you." Then he wandered down the hall to *Keyboard*.

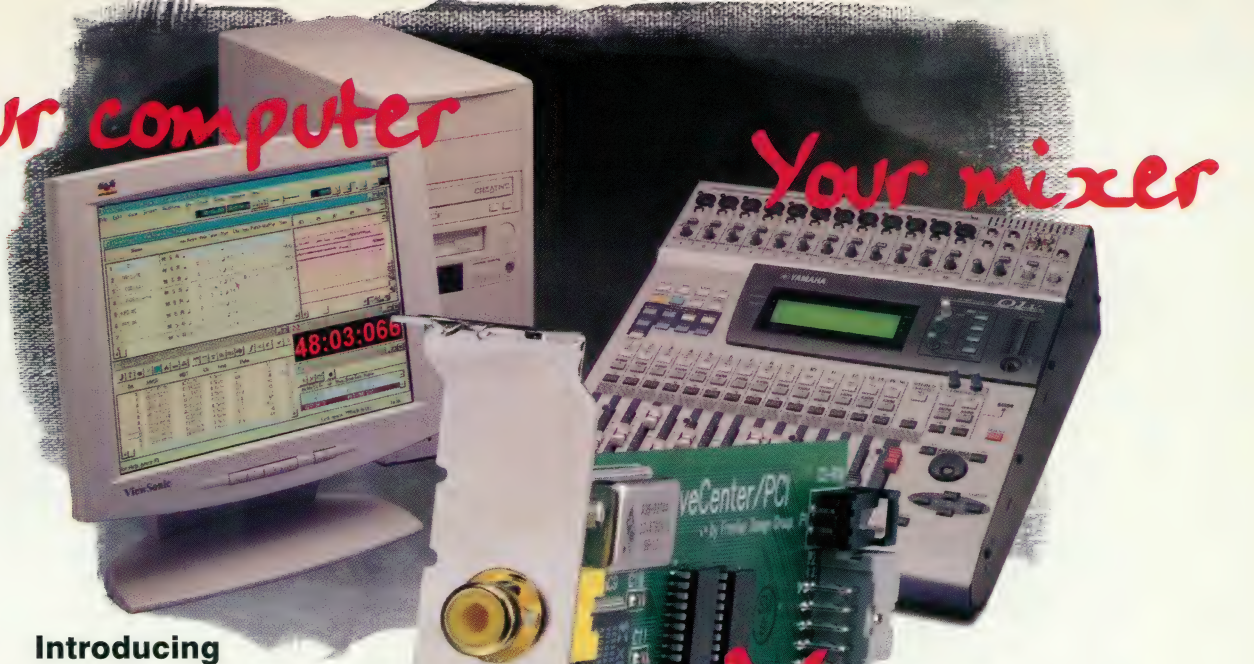
Unless you're a dyed-in-the-wool liberal who grew up singing "We Shall Overcome" and "If I Had a Hammer" around the campfire, you may wonder why meeting Pete Seeger would be such a thrill. If you even know his name, you probably remember him only as the author of a novelty hit called "Owimoweh." ("In the jungle, the mighty jungle, the lion sleeps tonight.")

But in the late '50s and early '60s, folk music wasn't just music. It was *message* music. The message wasn't about letting your hair grow and taking LSD, either; that started a few years later with the Beatles. Message music in the '60s was first and foremost a social message about navel-gazing; it became political only accidentally, because of the Vietnam War. Folk music was political from the git-go. Woody Guthrie had a guitar

THE KEYBOARD CHAIN GANG

A magazine isn't like a coal mine: There's no raw material to package and sell until a talented crew of people works together to create it. Over the years quite a parade of folks has passed through the doors of GPI and Miller Freeman and contributed their talents to the product you hold in your hands — way too many to list them all. Without meaning to disrespect the rest of the crew, from unpaid intern Mark Grey (who created our first Web site) and Leslie Bartz, our favorite long-suffering typesetter, to ace publicist Gretchen Horton, the list below contains only the editorial, art, and advertising staffers who worked directly on *Keyboard* over the years, with the dates for when they were actually on the masthead as part of our department.

Jim Aikin (Jan. 1976 —)
Randy Alberts (Nov. 1990 – Feb. 1994)
Greg Armbruster (May 1983 – Dec. 1985)
Mattee Balin (Apr. 1985 – Aug. 1989)
David Battino (Aug. 1995 – Feb. 1997)
Paul Brannock (Oct. 1988 – Oct. 1990)
Dan Brown (Oct. 1995 – July 1998)
Pat Cameron (Apr. 1992 – July 1996)
Lynne Chambers (June 1986 – June 1988)
Gary Ciocci (April 1998 —)
Paul Craven (July 1998 – Oct. 1998)
Jim Crockett (Sept. 1975 – Aug. 1989)
Deby Cronk (June 1981 – Sept. 1981)
Tom Darter (Sept. 1975 – Dec. 1986, Mar. 1991 – Oct. 1998)
Sibyl Heishman Darter (Mar. 1976 – Jan. 1979)
Maggie Diab (Jan. 1996 – July 1997)
Robert L. Doerschuk (July 1977 – Oct. 1995)
Rick Eberly (Feb. 1988 —)
Kristine Turnipseed Ekstrand (Sept. 1991 – Oct. 1992)
Andy Ellis (Feb. 1989 – Feb. 1991)
Ellayn Evans (Jan. 1980 – May 1981, Oct. 1981 – Aug. 1983)
Dan Fernandez (Apr. 1994 – June 1995)
David Frederick (Jan. 1986 – Mar. 1987)
Freff (Oct. 1988 – Apr. 1989)
Mitch Gallagher (May 1998 —)
Luanne Giacalone (Dec. 1985 – Sept. 1986)
Sheryl Golbuff (Mar. 1992 – Nov. 1993)
Doug Gordon (Aug. 1998 —)
Debbie Greenberg (Dec. 1990 —)
Ted Greenwald (Dec. 1985 – Mar. 1988)
Claudia Hartman (Sept. 1975 – Mar. 1976)
Vicki Hartung (Aug. 1984 – Sept. 1995)
Kyle Kevorkian (Jan. 1987 – July 1988)
John Krogh (Jan. 2000 —)
Linda Lawrence (June 1988 – Nov. 1989)
Chris Ledgerwood (Oct. 1976 – Dec. 1987)
Elizabeth Perry Ledgerwood (Jan. 1983 —)
Rich Leeds (Jan. 1987 – July 1994)
Rachel Lemons (Fall 1999 —)
Dave Leytze (Sept. 1987 – Sept. 1988)
Michael Marans (Jan. 1989 – Apr. 1997)
Jerry Martin (Feb. 1979 – Mar. 1980)
Paul Martinez (Sept. 1994 – June 1998)
Dominic Milano (Sept. 1975 – Nov. 1999)
Amy Miller (Mar. 1988 —)
Debbie Miller (June 1992 – Sept. 1994)
Sam Miranda (Nov. 1998 – Feb. 1999)
Michael Molenda (Dec. 1999 —)
Judy Pauli (Oct. 1979 – Mar. 1985)
Valerie Pippin (Mar. 1994 – May 1995, Aug. 1998 —)
Alis Rasmussen (Sept. 1983 – May 1986)
Holly O'Hair Ray (Aug. 1997 – Aug. 1999)
Ernie Rideout (Mar. 1994 —)
Jim Roberts (Aug. 1996 – July 1999)
Markkus Rovito (Sept. 1998 —)
Greg Rule (Dec. 1991 —)
Yecta Sadat (Nov. 1990 – Sept. 1991)
Marvin Sanders (June 1996 – Dec. 1999)
Cliff Scorso (Jan. 1995 – Apr. 1996)
Pete Sembler (June 1995 —)
Ed Sengstack (Apr. 1982 – June 1985, Aug. 1999 —)
Tammy Starnes (Feb. 1990 – Mar. 1991)
Kylē Swenson (Mar. 1996 – Mar. 1998)
Ron Taff (Apr. 1980 – Mar. 1982)
Ned Torney (Fall 1999 —)
Mark Vail (Apr. 1988 —)
David Williamson (July 1985 – Sept. 1988, May 1994 – Nov. 1996)
Alexandra Zeigler (May 1996 – Mar. 1998)



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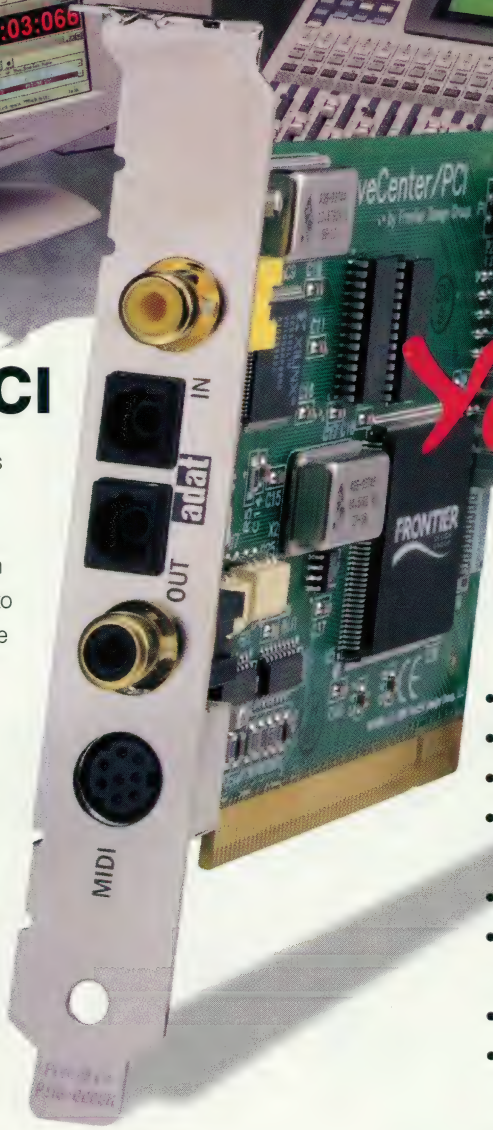

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inscribed with the slogan, "This machine kills fascists." And Pete Seeger, who had probably sung and played banjo at as many protest rallies as concerts, had more or less inherited the mantle of Woody Guthrie.

Pete shook everybody's hand. I remember that he gazed at a corner of the ceiling a lot, as if his sights were fixed on some celestial point far beyond us. And I remember that he was enthusiastic about the computers we were using in our offices. We had Kaypros at the time, gunmetal-gray word processors with little green screens and a whopping 64K of RAM. What Pete liked about the Kaypros was that they were in the hands of the *people*. "This is why the government will never be able to control everybody," he said. "Ordinary people can have their own computers."

Of course, he didn't know that someday Internet wizards would be able to survey the files on your hard drive. Even so, it was pretty darn good crystal-ball-gazing for a 70-year-old banjo picker.

The other artist who stands out in my mind, even though I never met him, is **Glenn Gould**. In case you're not a classical musician, I should explain that Gould was an eccentric Canadian virtuoso who didn't travel much. I don't travel much either, so we arranged to do a phone interview, and spoke for an hour or so. He was one of the three most intelligent, articulate artists I've ever interviewed. (The other two are **Wendy Carlos** and **Brian Eno**.)

The conversation with Gould was fascinating. You can read it in our Aug. '80 issue, if you can find a copy. He referred to himself several times in the third person as "GG," which confused me because I thought he was saying "Gigi."

But that's not the end of the story.

A month or so after the interview was published, I was sitting in my office one afternoon when the phone rang at Ellayn Evans's desk. Yes, those were the days when cheerful, competent human beings were still employed to screen phone calls. Ellayn covered the receiver with her hand, gave me a peculiar look, and said, "Jim, it's Glenn Gould for you."

Gould wasn't simply eccentric. He was downright reclusive. From what I've read, near the end of his life he didn't have a lot of close friends. We certainly weren't friends; the reason he called me was probably because whoever else he'd tried to call wasn't available.

He had been reading Arthur Rubinstein's just-published autobiography. Now, it would be hard to imagine two pianists more unlike one another than Rubinstein the *bon vivant* and Gould the icy intellectual. Gould cordially detested Rubinstein's whole approach to life and music, so he had taken pen in hand and written a scathing satire of the autobiography, which he was about to tuck in an envelope and send off to *Piano Quarterly*. But he wanted a little appreciation first.

For 20 minutes or so, he read me excerpts from his satire. I chuckled a bit more than I really felt like. I didn't get all of the jokes, since I hadn't read the Rubinstein book. But one has to be courteous, after all.

A few weeks later, at the age of 50, Glenn Gould was dead.

Since then we've lost Jerry Garcia, and **Frank Zappa**, and a lot of other incredibly talented cats. The wheel turns. Others are still with us, just a little older and grayer than before (as am I).

I'm glad I can still get excited by new music, and I'm hoping to meet and interview more astonishing artists in the next 25 years. But these days, most of them are younger than I am, so it's harder to idolize them. No matter what monster talents may come down the pike, I think I'll always be proudest to be able to say, "Yeah, I met Pete Seeger. And Glenn Gould called me once to read me something he'd written."

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KEY INFO #2

25 TOP MUSIC WEBSITES

25 years 1975-2000

Every modern keyboardist's rig can benefit from Internet access, as it provides a global connection to software and support files that will aid each aspect of the music-making process. Out of the thousands of candidates for our Top 25 list, the sites we chose are aimed at helping you get your music heard and sold online, learning about and finding new and used gear, making music your career, maintaining and getting the most out of your equipment, and becoming a true music scholar. We excluded gear, CD, and music download retailers because there are too many quality sites from which to choose. If you need examples of online music retailers, write to me at mrovito@mfi.com. Happy clicking!

by Markkus Rovito

Hyperreal
www.hyperreal.org

Dedicated to underground rave culture since '92, Hyperreal has been down since day one as a meeting ground for the ideas and philosophies surrounding the dance music community. Producers and DJs will find a wealth of advice from their peers on technique and gear. The Music Machines area features info on mods, schematics, and — most important — samples of many classic dance music tools.

Drum Machine Museum
www.drummachine.com

As you might expect, this site is an archive of photos and info on drum machines, from the latest Yamaha portable to the first rhythm machine way back in 1930! There are also user forums, ongoing polls, articles, and a manual library and copy service. The site is very thorough and is growing better with age. DMM is also the exclusive U.S. distributor of some very intriguing new analog instruments.

Synth Zone
www.synthzone.com

Essentially a collection of links, but a very extensive and well-organized one. No matter what synth you own, someone out there has probably made a home page for it, and you can find it at the Synth Zone. Need manuals, patches, technical advice, tips, and tricks? They're in here. Also many links for samplers, software, and effects.

Vintage Synth Explorer
www.vintagesynth.com

Photos, descriptions, specs, audio examples, approximate second-hand prices, and a short list of artists who used specific synths. Many sites attempt the same thing, but Vintage Synth Explorer is among the largest and best designed. Modern retro-style synths are also included, along with free classifieds to help you find that rare beast.

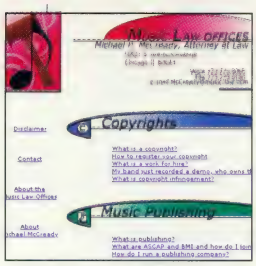
Shareware Music Machine
www.hitsquad.com/smm

Thousands of useful music programs are just a few clicks away, and more are added daily. Shareware, freeware, and demos of MIDI sequencers, notation programs, multitrack recorders, effects plug-ins, audio editors, soft synths and samplers, and much more can be downloaded for Windows, Mac, or Atari computers.

Illustration by Octavio Diaz

Zebra Music
www.zebramusic.com

Advice and guides on how to survive as a musician. The site includes opportunities to connect with other musicians through chats, discussions, and a Gig Sharing Network. You'll also find a listing of record labels, a music business FAQ, and a healthy archive of *The Musician Tip Sheet*, a free monthly zine.



Music Law Offices
www.music-law.com

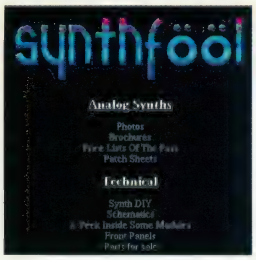
Because most musicians don't attend Harvard Law. Here you'll learn about copyright law, publishing, running a band as a business, and what to look for in a record contract. To get into the real nitty gritty, you'll have to pay for consultation, but there is still a lot to learn here for the legalese-impaired troubadour.

Midisites.com
www.midisites.com

There are hundreds, maybe thousands of MIDI file sites on the Web, but Midisites.com will help you find exactly what you want quickly. From the homepage, click on the catagory you want, and you'll get a list of links to sites for that category. You'll soon find more MIDI files than you could ever hope to use.

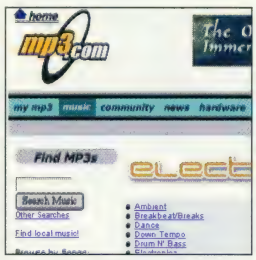
Sonic State
www.sonicstate.com

A giant compendium of feedback from real-world users on the state of synths, samplers, and computer music software and hardware. The bulk of the content is user reviews and message boards, but you'll also find daily industry news, classifieds, and an online store featuring sample CDs.



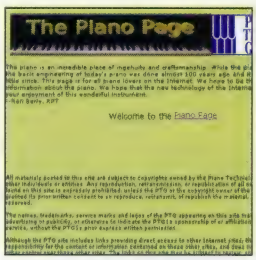
Synth Fool
www.synthfool.com

Slightly off-kilter human beings who want to build and modify analog synths will find a kindred spirit in the Synth Fool. The site also includes a great archive of analog synth pics, and prominent links to useful synthesizer FAQ pages.



MP3.com
www.mp3.com

Budding artists can add their original MP3s for free to this site's tremendous library of independent music. The name recognition of the site alone makes the opportunities for artists' promotion of their music more tantalizing than on other similar sites.



The Piano Page
www.ptg.org

Brought to you by the Piano Technicians Guild, fans of the grand ole keyboard can get technical information, plus links to piano teachers, dealers, magazines, competitions, manufacturers, and newsgroups. There is also a Virtual Piano Museum.

Musician's Health
www.musicianshealth.com

Although this site is a solicitation for chiropractic services, there is quite a bit of information about why musicians are particularly susceptible to certain repetitive stress injuries and how to avoid them. Worth a look for active performers.

All Music Guide
www.allmusic.com

From the publishers of the acclaimed *All Music Guide* books, this is your Bible of popular music info. Artist information includes bios, album reviews, discographies, and related artists. Can't remember who wrote "Turning Japanese" in the '80s? The excellent search engine lets you search by song title, as well as by style, label, album title, and artist name.

Internet Underground Music Archive (IUMA)
www.iuma.com

IUMA has unmatched street cred for being the first site to offer promotional services to unsigned artists way back in '93. Bands receive random play on Radio IUMA, a URL with their name in front, and the functionality to post MP3s, sell CDs and merchandise, create message boards, and email fans. The services are free until you sell merchandise, when IUMA takes 50% of the sale.

CDstreet.com
www.cdstreet.com

Rather than hosting musicians' websites, CDstreet sells the functionality of secure credit card ordering from bands' individual websites for 15% of the sale. Bands don't pay anything until they sell product. Artists using CDstreet's service will have their homepages linked from the CDstreet site. Independent labels are also encouraged to join.

Riffage.com
www.riffage.com

A relative newcomer to the online label game, Riffage is similar to IUMA and others in that they will host your band's website and allow you to sell CDs and merchandise. They differ in that they allow you to sell individual song downloads, and they promise free, aggressive promotion of their artists, including promotion of live performances. ➥

25 TOP MUSIC WEBSITES

The Virtual Synthesizer Museum
www.synthmuseum.com

It's not as easy to navigate, but the Museum includes entries and facts that Vintage Synth Explorer does not. Also includes interviews and links to further synth collections.

GearSearch.com
www.gearsearch.com

Use GearSearch.com as a starting point for finding local dealers, mail order vendors, and used gear outlets. Find free catalogs, retailers by state, or instrument-specific dealers.

World Wide Pro Audio Directory
www.audiodirectory.nl

An international directory listing resources for all music industry professionals, from roadies to high-end studio engineers. Not comprehensive, but a nice start.

Music Industry Career Center
www.music-careers.com

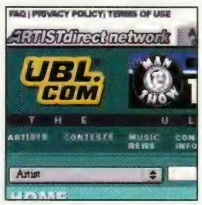
Possibly the only Internet job site focused on the music industry. Positions range from session musicians to record company executives.

Electronic Music Interactive
http://nmc.uoregon.edu/emi

Beginners start here! Shockwave-enabled surfers can visit this site for a primer course on the nature of sound, synthesis, and MIDI. Even the experienced may find some enlightenment.

120 Years of Electronic Music
www.obsolete.com/120_years

Curious about the origins of today's astounding music technology? This site will educate you on the Telharmonium, the Choralcello, the Heliophon, and other primitive oddities that laid the groundwork for today's whiz-bang high-tech toys.



Ultimate Band List
www.ubl.com

A massive database of information on recording artists. It's part of the greater Artist Direct Network, which is a portal site that will lead you to the official merchandise sites for many popular artists, from Tori Amos to Rob Zombie.

Ebay
www.ebay.com

The world's premiere auction site had more than 17,000 auctions listed under "Musical Instruments" at press time. That's more used gear than you'll come across anywhere else on the Net. ■

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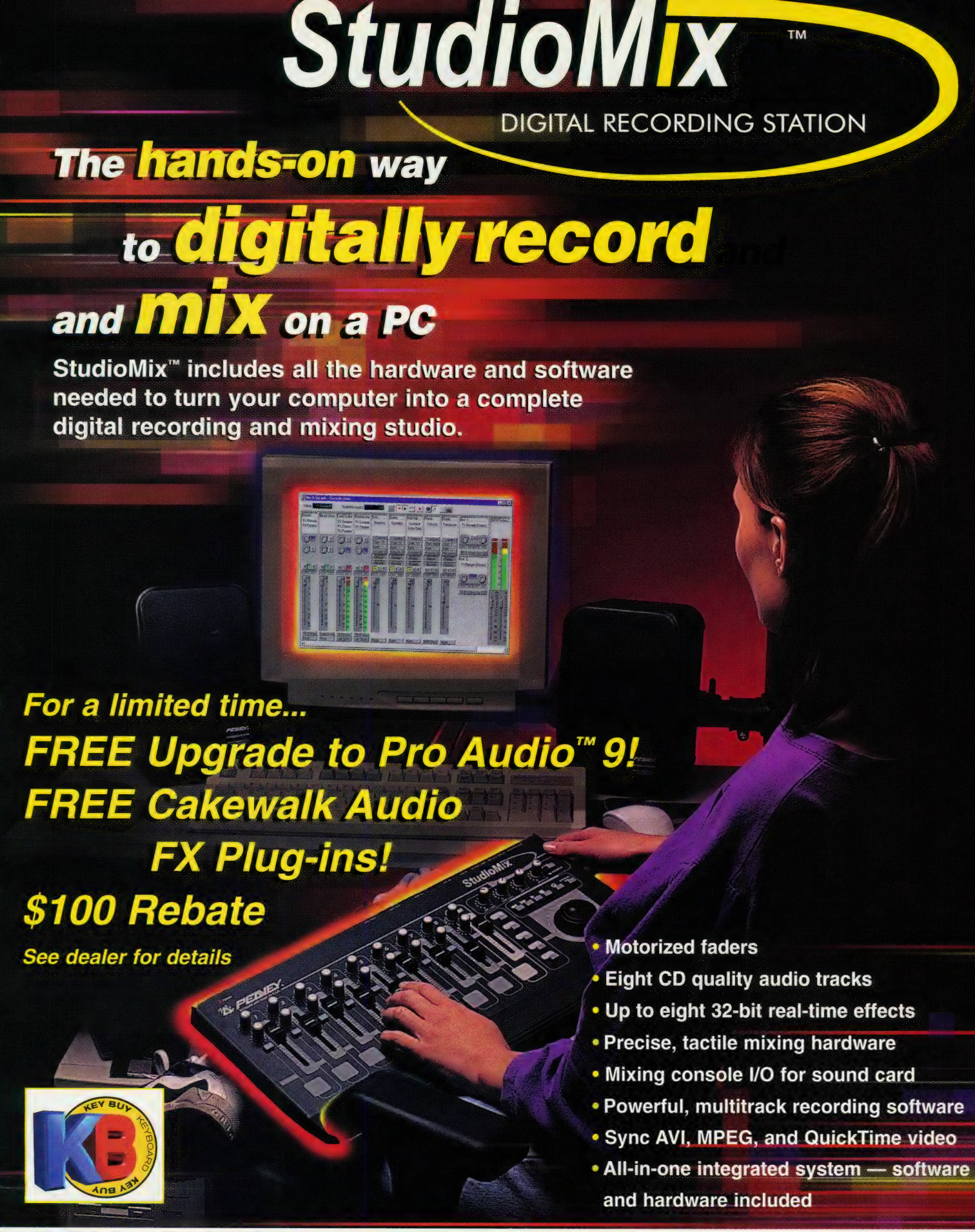

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25 PLAYERS WE'LL MISS

The trouble with life is that, like music, it eventually comes to an end. In the 25 years we've been documenting music history from a keyboardist's perspective, we've lost a number of two-fisted friends. Sometimes the loss of a great player signals the end of an era; at times it echoes an era already long past. Other deaths come far too soon, interrupting remarkably creative lives in mid-phrase, long before the final chorus.

The players listed below have all gone on to the big session in the sky during *Keyboard*'s watch. You'll recognize some of the names here, while others may be news to you. In every case, behind the individual is a legacy of recorded work that is with us still. We've suggested an album or two for each artist to encourage you to re-examine or get acquainted with the music behind the names.

by Ernie Rideout

Count Basie (1904-1984). Basie may not have invented swing, but he sure perfected it. He sprinkled his trademark minimalist solos and fills sparingly throughout his work with his big band, but he stretched out perceptibly on the recordings he did for Pablo in the '70s. And on every track: love, baby, nothin' but love. You can still catch the Basie band on tour, too. *The Bosses* (Pablo), *Basie Swings, Joe Williams Sings* (Polygram).

James Booker (1939-1983). With boundless technique, an incredible sense of time, and an eclectic mix of classical and bayou repertoire, was Booker a genius of New Orleans piano, or was he crazy? Just ask a few of the players who are still in awe of what they heard him play during his brief lifetime. His name came up in our interviews with Harry Connick, Jr., Henry Butler, George Winston, and Dr. John. *Classified* (Rounder).

Charles Brown (1922-1999). Brown created a blend of swing, blues, boogie-woogie, and classic R&B as only someone who had lived through all those eras could. Ray Charles and Amos Milburn have cited Brown as an influence. His silky baritone vocals helped him climb the charts on many occasions, and the recordings he made at the end of his life are among his best. *The Best of the Driftin' Blues* (EMI), *These Blues* (Verve).

Clifton Chenier (1925-1987). Hailed as the inventor of zydeco, Chenier took blues, boogie, and Cajun folk styles and forged them into an accordion-based groove juggernaut. Too simplistic, you say? Rough around the edges? Okay, let's see *you* keep a Louisiana dancefloor packed for four hours or more, and smile the whole time. He earned the crown that he wore to nearly every gig. *Zydeco Dynamite* (Rhino).

Floyd Cramer (1933-1997). Famous for his own instrumental hit "Last Date," Cramer single-handedly (well, we hear he used both hands) created that ubiquitous country piano sound. His approach emphasized technical restraint and highly emotional phrasing combined with impeccable timing — still the essential formula for success for a Nashville pianist. *The Essential Floyd Cramer* (RCA).

Bill Evans (1929-1980). You could spend your whole life listening to Bill Evans's jazz trio recordings over and over again and still hear new things every time. Revered for his innovative approach to voicings and his compositions, Evans valued a highly intuitive approach to collective improvisation with his sidemen. *Sunday at the Village Vanguard, Waltz for Debby* (Original Jazz Classics).

Dwayne Rudolph Goettel (1964-1995). Goettel's sampling and synth work helped give Skinny Puppy its dark, danceable blend of industrial and goth. *Cleanse, Fold & Manipulate* (Nettwerk).

Grateful Dead: Keith Godchaux (1948-1980), Brent Mydland (1953-1990). Godchaux and Mydland were the second and third players to assume the cursed keyboard chair for the Grateful Dead (the first being Ron "Pigpen" McKernan, who died in

Illustration by Octavio Diaz

1973). Both endowed with classical technique, these two sidemen adorned the loose Dead grooves with brilliant playing. Godchaux on *Blues for Allah* (Grateful Dead), Mydland on *In the Dark* (Arista).

Don Grolnick (1947-1996). Equally at home in the downtown jazz scene of New York and as music director for James Taylor, Grolnick achieved cult status among jazzers long before his untimely passing. Many of his compositions have become standards in the modern jazz repertoire. *The Complete Blue Note Recordings* (Capitol), *Hearts & Numbers* (Hip Pocket).

Vince Guaraldi (1928-1976). There's a lot more to Guaraldi's work than "Linus & Lucy" and his hit version of "Cast Your Fate to the Wind," but if you're new to his warm, melodic approach to jazz and Latin jazz piano, why not start there? *Black Orpheus* (DCC Jazz), *A Boy Named Charlie Brown* (Fantasy).

Hampton Hawes (1928-1977). Hamp was one of the under-recognized heroes of bebop piano. His clarity of line and inventiveness were unmatched, and his spirit comes through on all of his recordings. His autobiography, *Raise Up Off Me*, is essential reading for jazz pianists and fans. *As Long as There's Music* (Polygram), *This is Hampton Hawes, Vol. 1* (Original Jazz Classics).

Earl "Fatha" Hines (1903-1983). One of the greatest jazz pianists ever, Hines took the stride piano style of the '20s and brought it into the modern jazz era. He recorded prolifically, and he was a major influence on almost all of the top players, including Art Tatum, Nat King Cole, and Teddy Wilson. Want to inspire your left hand? Spin some Fatha. *Piano Man* (Bluebird).

Richard "Groove" Holmes (1931-1991). Despite having recorded the definitive B-3 version of "Misty" in the '60s, Holmes was the consummate soul-jazz organist. His recordings with tenor saxophonists Ben Webster and Gene Ammons are legendary. *Blue Groove* (Prestige).

Nicky Hopkins (1944-1994). One of the greatest rock 'n' roll pianists ever, Hopkins recorded with the Rolling Stones, John Lennon, the Who, the Kinks, Jefferson Airplane, and many more. He could pound through any number of electric guitars, and his ability to lock in with or float above the time was uncanny. *The Tin Man Was a Dreamer* (Columbia); with members of the Rolling Stones, *Jammin' with Edward* (Virgin).

Kenny Kirkland (1955-1998). One of the few jazz virtuosos to make a mark on the pop world, Kirkland recorded with Ben E. King, Stephen Stills, David Crosby, and most notably Sting. He was also the pianist for Jay Leno's *The Tonight Show*. Recordings under his own name are few; he completed one just a few weeks prior to his death. His versatility and mastery come through on almost all of his recordings, especially those with Branford or Wynton Marsalis. Also indespensible is Sting's concert video, *Nothing Like the Sun*. With Wynton Marsalis, *Black Codes (From the Underground)* (Columbia).

Thelonious Monk (1917-1982). As innovative a composer as he was a player, Monk remains the poster child of bebop piano. His angular style was a language unto itself, and he is still one of the most influential and widely-imitated of all jazz pianists. *Monk Alone: The Complete Solo Columbia Recordings* (Columbia Legacy), *Monk's Music* (Original Jazz Classics).

Phineas Newborn (1931-1989). Newborn came up with his characteristic octave soloing technique as a child just trying to be heard in the family band. With tremendous technique and inventiveness, his brand of trio-based bop was among the highlights of jazz piano in the mid-'50s. *The Great Jazz Piano of Phineas Newborn* (Original Jazz Classics).

Charlie Palmieri (1927-1988). The older brother of the Sun of Latin Music, Eddie Palmieri, Charlie expressed his innovative blend of traditional Puerto Rican, Cuban, and jazz styles through his fiery technique and creative arrangements. Much of his best work was as a sideman with such artists as Herbie Mann and Tito Puente. With Mongo Santamaria, *Afro Blue: Picante Collection* (Concord Jazz), *Impulsos* (MPL).

Michel Petrucciani (1963-1999). Petrucciani recorded and toured with Lee Konitz at age 17, and is credited for inspiring saxophonist Charles Lloyd to resume performing. Prodigious technique and musicality make Petrucciani's recordings a multicourse feast for jazz pianists. *100 Hearts* (George Wein), *Solo Live* (Dreyfus).

Sunnyland Slim (1907-1995). The father of Chicago blues piano, Sunnyland Slim was the piano force behind such blues greats as Muddy Waters, Koko Taylor, and Otis Rush. Slim's powerful technique also inspired generations of rock pianists. *Slim's Shout* (Prestige); with Muddy Waters, *Chess Box* (MCA/Chess).

Richard Tee (1943-1993). One of the most prolific of all studio hired guns, Tee infused hundreds of soul, R&B, and funk albums with his in-the-pocket, gospel-tinged playing on Rhodes, piano, and B-3. He was also a highly regarded jazz sideman, but if you scan the personnel on just about any soul-oriented release from the '70s, you're likely

to see Tee's name. *Stuff* (Warner Bros.); with Esther Phillips, *From a Whisper to a Scream* (Sony).

Katie Webster (1939-1999). The Queen of Swamp Boogie, Webster laid down her pounding piano grooves for artists as diverse as Slim Harpo, Lightnin' Slim, Clifton Chenier, Guitar Junior, Bonnie Raitt, Otis Redding, and Robert Cray. She was also a fixture on many important zydeco albums, such as those by Rockin' Sidney. Want to infuse your playing with energy with a capital "E"? Pick up these discs: *Swamp Boogie Queen, Deluxe Edition* (Alligator).

Teddy Wilson (1912-1986). The consummate swing pianist, Wilson's work with Benny Goodman in big and small band settings influenced generations of jazz pianists. A perfect sense of melody and swing coupled with an impeccable left hand are only a couple of aspects of his immense talent. His trio recordings from the '50s are a delight, and can inspire anyone interested in the trio as an artform. *Impeccable Mr. Wilson* (Verve), *Central Avenue Blues* (Vintage Jazz Classics).

Andrew Wood (1966-1990). Grunge was widely considered to be the domain of guitarists, but in fact one of its founding fathers was keyboardist Andrew Wood, who fronted a Seattle band called Mother Love Bone. After his premature death from an overdose, the surviving members went on to form Pearl Jam. Wood's few recordings show more than just a free spirit: His pop-based stylings provided a firm foundation for the loose sonic mayhem that was laid on top of his parts. *Apple* (Polydor), *Stardog Champion* (Stardog/Mercury).

Larry Young (1940-1978). Young was one of the most innovative jazz organists. With roots in R&B and soul, his jazz vision emerged full-fledged when he began recording for Blue Note in the mid-'60s. How innovative can you be on a Hammond? Well, comparisons with Coltrane were common, if that's any indication. *Unity* (Blue Note).

Frank Zappa (1940-1993). Though he wielded his guitar onstage, Frank was no stranger to keyboards and synthesizers. His life-long passion for putting dots on manuscript paper was kicked into overdrive when his wife, Gail, gave him a Synclavier. The music that followed was unlike anything heard before or since, and it might be an interesting opus to begin your collection with. *Jazz From Hell, We're Only In It for the Money* (Rykodisc)

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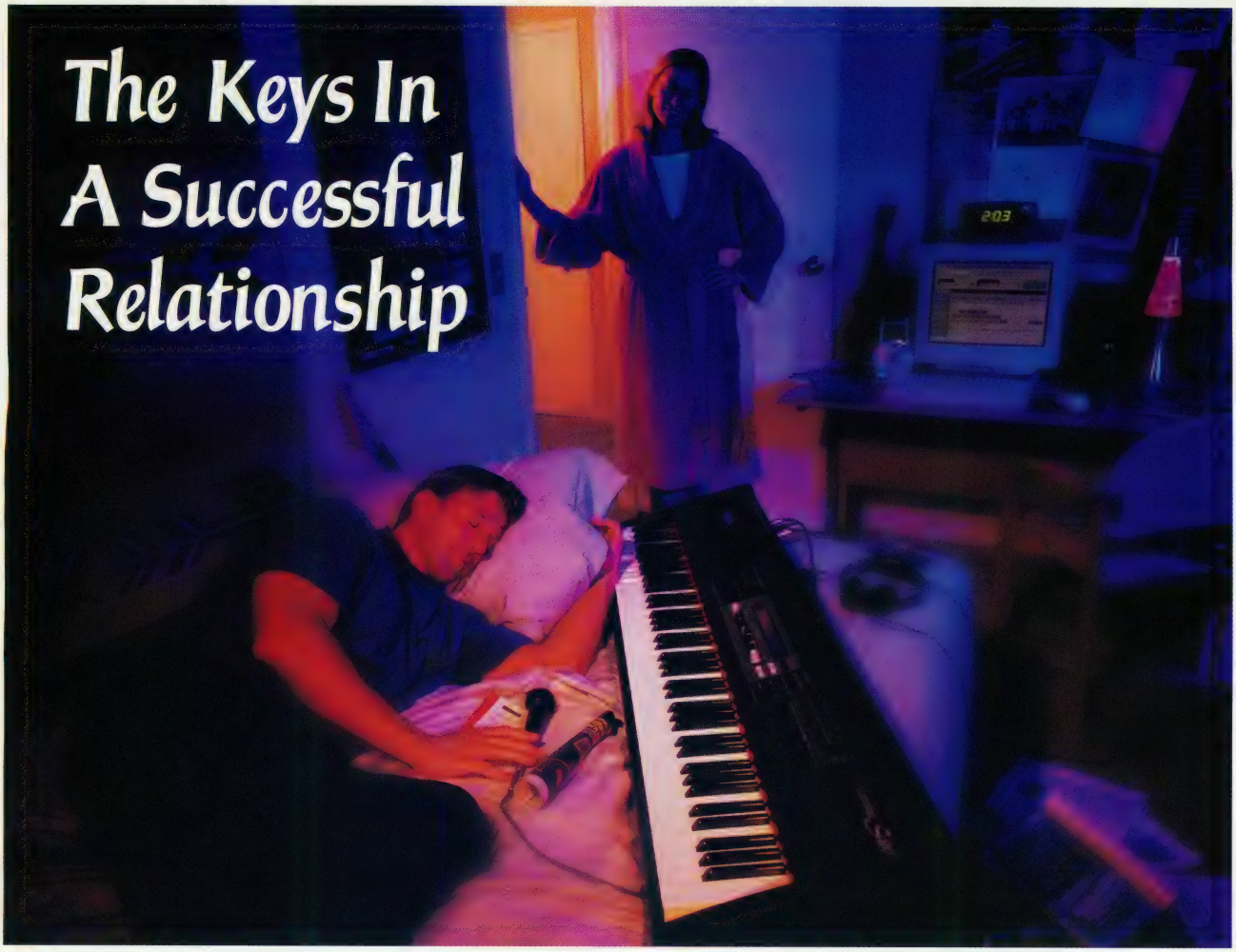

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25 YEARS OF CLASSIC KEYBOARD QUOTES

There's been no shortage of compelling quotes in the pages of *Keyboard* over the years. In each of our anniversary issues (5, 10, 15, and 20), we included a batch of classic quotes from the preceding years. We'll do it again here, but focus mostly on the mid- to late '90s. Just for those of you who missed the earlier editions, however, let's start off with a few choice cuts.

"The equipment that's available now only approximates what acoustic instruments can do. We've got oscillators, filters, very crude envelope generators. Not that it's important to synthesize sounds of real instruments, but what makes real instruments interesting is that they've got very complex sound structures. And that's what I want to see in synthesizers — machines that will produce magnificent sounds." ***—Tom Oberheim, May '77***

"We live in an electronic age. I always tease people when they ask, 'Why are you playing electric?' I say, 'Well, hey, man, are you using candles at home? Aren't you plugged in?'" ***—Les McCann, Sept. '78***

"I'm the man who put piano out front; that son of a bitch used to be in the background, behind all those guitar pluckers. Brubeck, Edgar Winter, Peterson — why, I can play more piano with my *dick* than these sons of bitches ever dreamed of!" ***—Jerry Lee Lewis, Feb. '82***

"If you play a synthesizer using the whole keyboard, you're really looking for trouble, because the harmonics on the top end tend to be flat, and on the bottom end tend to be sharp. Some synthesizers have those pseudo-stretch programs, but they don't work. That's why records that use mainly synthesizers just aren't in tune. I hate listening to that kind of stuff; it's like my head is being squeezed in a vise. So I try to use tunable instruments — Rhodes, acoustic piano, guitars. I think they should make a new Grammy for the most in-tune record; I bet I'd win." ***—Donald Fagen, Aug. '93***

"MIDI is so out of time. It's crap. It gives you a constantly sloshy sound. I can't stand it." ***—Vince Clarke (Erasure), Sept. '94***

"Today's samplers, they're just shit, really. I designed and built my own sampler for a college project once. When it worked, I reckon it pissed on just about any manufactured sampler." ***—Richard James (Aphex Twin), May '94***

"Music production systems [of the future] will have more software components than they have today. They're all going to merge into integrated systems that will be computer-based. They'll have tons of DSP processing horsepower inside. If you want to use a synth, for example, you'll load a software application that is the synth." ***—Peter Gotcher (then-president of Digidesign), Sept. '95***

"Because Nine Inch Nails is focused on a certain element of my head, usually the more negative region, people get the idea that that's all there is. But it's not. That's not to say I don't have a lot of problems to work out, but I don't stay in a dark room all day with a sheet over my head." ***—Trent Reznor, Dec. '95***

"It's easy to run to a *Halloween* movie soundtrack or *Nightmare on Elm Street* and get a scary sound, but what's *really* fun is to go back and find something happy — *H.R. Puffenstuff* or some toy commercial — get a sound out of that and twist it into the most evil, horrifying thing in the world." ***—Pogo (Marilyn Manson), Jan. '96***

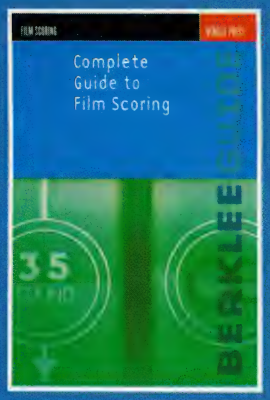
"I feel it's important to know that the song is strong before you get carried away with technology, because sometimes you fool yourself. You might think you've got a great song going, but in actual fact, what you're really liking is a synth sound or a bass line." ***—Martin Gore (Depeche Mode), July '97***

"You can make a very warm song with a guitar, but you can also make a very cold song with a guitar. And with a computer you can make a very warm song, but also a very cold song. Computers don't represent the evil force from the future. You can't possibly blame the instrument." ***—Björk, Jan. '98***

"We have a 'no recall' policy, and this is a new thing in remixing. It's not to dis, but back in the day when Picasso was hired to do a painting, he painted it. You either liked it or you didn't, but you paid for it and took it. That's how it worked. Now that's how it works with me. 'Armand, what he does is art. Respect what he does. You want a mix from him, there's no recall.'" ***—Armand Van Helden, June '98***

"One of Madonna's favorite phrases was: 'Don't gild the lily.' In other words, keep it rough, and don't perfect it too much. It's a natural urge for computer buffs to perfect everything because they can, and we were very wary of that." ***—William Orbit, July '98***

Illustration by Octavio Diaz



Where music meets Hollywood — it's an exciting place to be. For composers who've mastered the craft, scoring for film and television is a career that's both creatively fulfilling and financially rewarding. At Berklee, Richard Davis is helping many of the field's leading musicians get their start. His book, *Complete Guide to Film Scoring*, is an essential resource for both professionals and students, offering shrewd insights into the business, the creative process, and the production techniques of film and TV scoring. Based on the Berklee film scoring curriculum, the book includes sections on writing and recording, contracts, publishing, interviews with top film-scoring professionals, and much more. To buy *Complete Guide to Film Scoring*, visit your local music or bookstore, or visit our Web site at **berkleepress.com**.

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25 TIPS FROM TOP PLAYERS

25 years 1975-2000

It would be nearly impossible to count the number of great keyboard artists who've generously given up their playing secrets in the pages of *Keyboard* over the past 25 years. Sure, they love to talk about gear, too. But when it comes down to it, *Keyboard* has always been about the music.

Here is a wide-ranging collection of some of the best tips, tricks, and techniques that have appeared in our pages over the 25-year span of *Keyboard*, interspersed with new tips created just for this special issue.

compiled by Ernie Rideout

CREATIVE DEVELOPMENT

Bill Evans

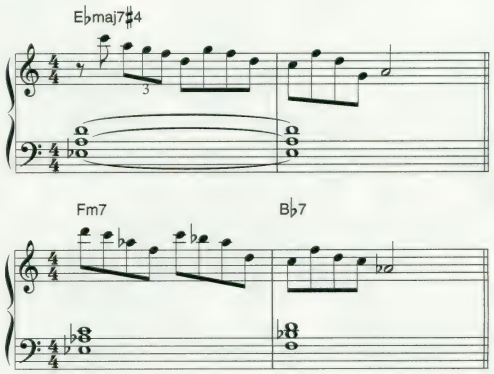
I believe in things that are developed though hard work, especially through introspection and a lot of dedication — it's usually a much deeper and more beautiful thing than if a person has ability and fluidity from the beginning. I say this because it's a good message to give to young talents who feel as I used to when I heard musicians playing with great fluidity and complete conception early on and I didn't have that ability. I had to know what I was doing. And yet ultimately it turned out that these people weren't able to carry their thing very far. I found myself being more attracted to artists who have developed through the years and become better and deeper musicians.

Miles Davis is an example of somebody who I think was a late arriver, even though he was recorded when he first came on the scene. You can hear how consciously he was soloing and how his knowledge was a very conscious thing, too. He constantly kept working and contributing to his own craft of writing and playing. And then at one point it all came together and he emerged with maturity, and he became a total artist, very influential, making a kind of beauty that has never been heard before or since.

APPLYING PENTATONIC SCALES TO JAZZ

Andy LaVerne

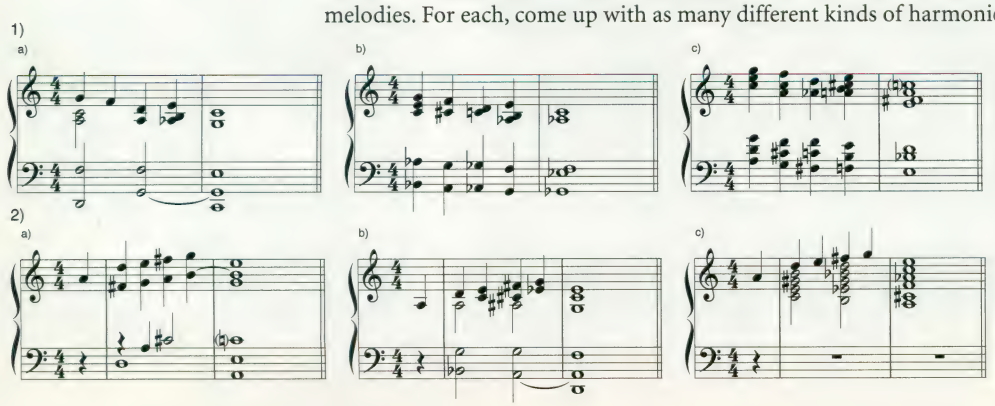
Here are two ways to use a pentatonic scale.



REHARMONIZATION

Chick Corea

By adding just a few notes in the left hand underneath a melody, you'll get a whole different interpretation, a broadening of the original intention. To get in tune with the possibilities, write out some short but complete melodies. For each, come up with as many different kinds of harmonies as you can (Example 1a, b, and c).



Example 2a shows a melody harmonized with the standard progression that most people would expect to hear. Example 2b involves a little alteration with a slightly unexpected turn at the end.

Example 2c adds more notes and colors in a higher register. If you come out at the other end with ten or 15 new pieces, that won't be so bad, will it? If you want more inspiration, listen to anything recorded by Art Tatum.

Illustration by Octavio Diaz

FINGER INDEPENDENCE FOR IMPROVISATION

Borah Bergman

When you improvise, you don't have time to think about fingering. You want to visualize the phrase and have the hand automatically take it. To do this, I developed my method of using different finger combinations. Practice these combinations systematically in each hand, using each finger alone. First, improvise melodies with just the thumb, then with each individual finger in turn. After that, improvise using fingers in combinations of only two fingers (1-2, 1-3, 1-4, 1-5, 2-3, 2-4, 2-5, 3-4, 3-5, 4-5), three fingers (1-2-3, 1-2-4, 1-2-5, 1-3-4, 1-3-5, 1-4-5, 2-3-4, 2-3-5, 2-4-5, 3-4-5), and four fingers (1-2-3-4, 1-2-3-5, 1-3-4-5, 2-3-4-5).

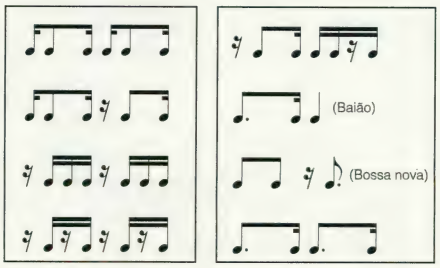
These patterns represent the fingers you use, not the sequence in which you use them. When you practice, go through all of them so you will be open to any design, and any finger will be able to go where it wants to.

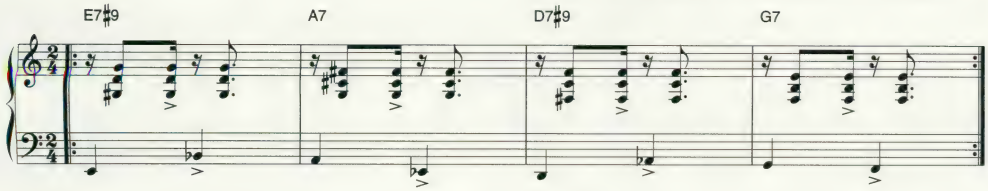
Start improvising with the left hand in various fingering combinations. Every time you change from one set of fingers to another, it changes the way the melody unfolds. As you go through these fingerings, you'll find that the anxiety you feel about restricting yourself to certain designated fingers disappears, because you'll be playing with all your fingers.

BRAZILIAN PIANO

Eliane Elias

For a taste of Brazilian piano, play this example as written. Then apply these additional rhythms to the right-hand part.





DEVELOPING SOLOS

"Blue" Gene Tyranny

My sense of improvisation is that you're doing variations *toward* a theme, and once you find it, you go on to something else. Of course, you have to start somewhere, so you start with a tune, a melodic fragment, or maybe just a sound that you want to produce. It's like you're talking. You start a conversation and then you work yourself up to a point where you're doing something you never knew you could before, playing something you never consciously thought of.

HOW TO STUDY JAZZ ORGAN

Jimmy Smith

I had to stop Jimmy McGriff from coming over to my house. He was waking me up at nine in the morning! He wanted to beat Groove Holmes. So I'd show him something. Then Groove would sneak over in the afternoon. He'd say, "Jimmy McGriff wasn't here today, was he?" I'd say no, but I was telling them both lies; I was teaching them the same lick. Then, when Groove went to hear McGriff, he said, "That's my lick!" "No, that's Jimmy Smith's lick." "No, that's *my* original lick, man." Then McGriff would say, "You're a licking mofo, man."

HOW TO MOVE A PIANO

Tom Waits

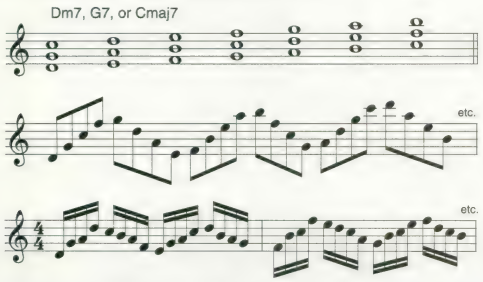
Early in his career, singer/songwriter/pianist/sound sculptor Tom Waits was living in the last unit of one of Hollywood's less elegant motels. His Steinway upright occupied the far corner of his kitchen.

"You'll notice what I had to go through in order to get the piano in," he said. "First of all, I just could barely get it through the threshold. Then I had to saw off the drain board." He motioned to the ragged edge of the kitchen counter next to the sink. "My next obstacle," he continued, pointing towards a splintered area of the kitchen, "was a broom closet. Of course, I made short work of that son-of-a-bitch."

COMING UP WITH VOICINGS AND MELODIC IDEAS

David Garfield

Knowledge of the modes is not only the key to improvising and making music on the fly, but it also helps you come up with voicings and parts. You can grab any cluster of notes from the scale to create a voicing, or to create parts or grooves. You get a melodic idea, then harmonize it through the use of these notes. Here is a voicing idea and a couple of melodic patterns that are a little offbeat. Try them in all 12 keys and then make up your own:

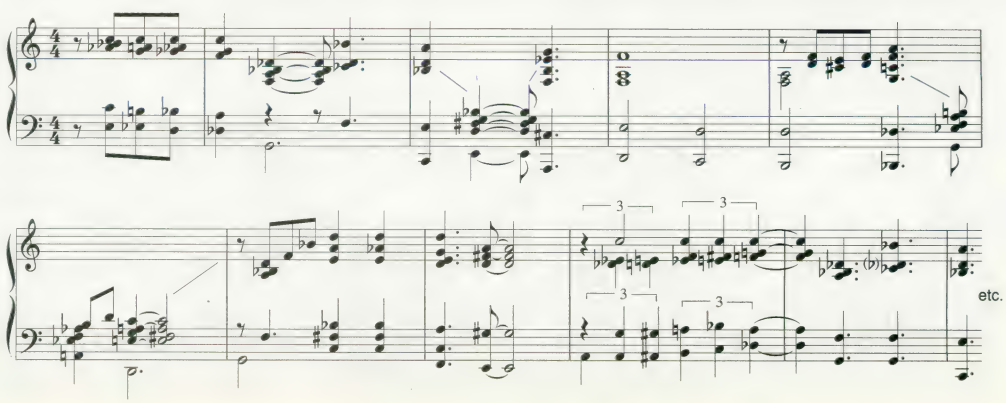


VOICINGS

Clare Fischer

I'm not a pianist who writes music, I'm a writer who plays the piano. Harmonies in my life have always encompassed what we call the Law of Diminishing Returns. You have an acre of ground, you plant so many seeds, and it grows so much of a harvest. Then you decide if you put some fertilizer on it, you'll get a greater yield. So you put the fertilizer on, then you say, "I got one-third more product that time, so I'll put more fertilizer on." But you don't get as much profit the next time. As you go on, you end up with mostly fertilizer.

Chords are that way, too. When a young player first learns to play a 6th chord, they use it so much that eventually it seems like a cheap product. So they start avoiding it. Then you run into somebody like Antonio Carlos Jobim, who writes a song beginning on a 6th chord, but he'll write it in such a way, say in the key of A, from the top down, the melody note is an F♯, under that are C♯ and a G♯, and an A in the bass. This means that you've added a major 7th to that chord. You're still using the 6th, but you've found something different to do with it that makes it alive. Here is a passage as I'd play it:



COMPOSING

Joe Sample

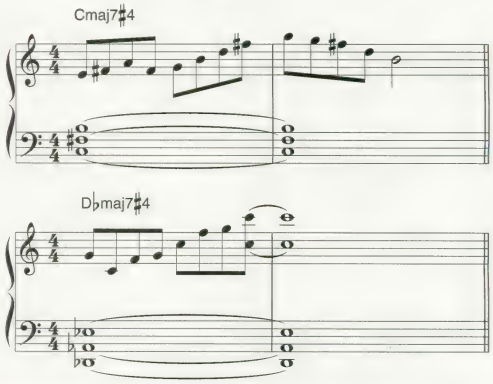
When I start to compose at the piano, I need to have a feeling that there are no hassles in my life. If I'm worried about business problems or the band breaking up, I just can't write. You've got to be in the right frame of mind; you can't have any hatred in you at all. Then when I begin playing, I watch my fingers moving. I'm not telling them where to go. The moment I tell my fingers where to go, I'm not composing — I'm simply dealing with clichés.

That's my whole principle: Let the tape recorder run, watch my fingers, and don't analyze what I'm doing. Every now and then I'll lose that, and I'll sit there and get angry. I'll be stumbling and fumbling, and I'll think, "I've lost it. What's happened to me? I can't write anything!" Then, all of a sudden, I'll say, "Wait a minute, Joe. You're just telling your fingers what to do." When I sit there and just watch my fingers play things, it's a strange zone — it's a thrill.

APPLYING THE LYDIAN MODE TO JAZZ

Andy LaVerne

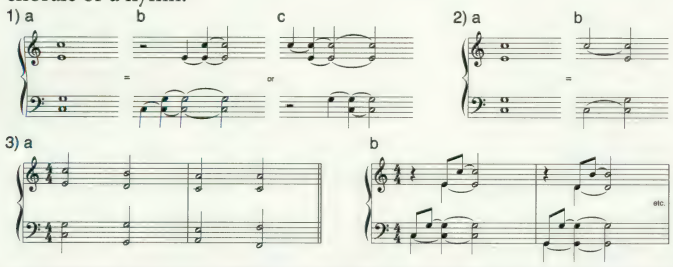
Here are two ways to use the Lydian mode.



IMPROVING YOUR SIGHT-READING

Tom Darter

Sight-reading is a skill that can be acquired through study and practice. It involves perceiving the vertical sonorities in piano music while looking ahead to determine what fingering will best get you to the next sonority. Here's the process: Take in a chord with your eyes, move your eyes horizontally to the next chord, decide what fingering to use on the first chord, then play the first chord. This may sound complex, but it's only complicated until you make it second nature. To do so, let's begin with simple triads with standard spacings —the kind of texture you'd find in a Bach chorale or a hymn:



Play each chord one note at a time, arpeggiating from bottom to top or from top to bottom. Play the four notes in a slow, steady rhythm. Practice this with a variety of simple chordal piano pieces (Example 1a, b, and c).

Next, begin teaching yourself to see two places at once: Play the top and bottom notes of the chord together, then add the notes in the middle (Example 2a and b). This trains your eye to take in the whole chord as a unit.

When you're comfortable with this, try reading through some short progressions using the arpeggio method (Example 3a and b). When you get to the point where this process comes quickly to you, you're ready to sight-read some chord progressions as written, in time. You can use the chorales of J.S. Bach to create your own exercises. At first, stay away from chorales that have a lot of contrapuntal motion; for the time being, focus on chordal textures. Read through a chorale, or even just one phrase of one chorale, using either of the arpeggio methods. Keep your rhythm steady!

HOW TO PRACTICE

David Bryan

Pick up that damn Hanon and *move your fingers!*

HAND INDEPENDENCE

Dave Brubeck

Play through a song using a duplet rhythm in the left hand and a triplet rhythm in the right. Use other combinations of odd time signatures. I might also play in one key with my left hand and in a different key with my right.

THE SECRET TO DEVELOPING AN INDIVIDUAL STYLE

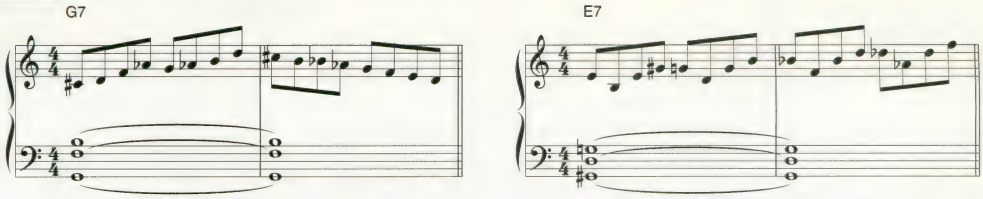
Jaki Byard

One time Chan, the cook at the Five Spot in New York, came up to me and asked, "Thelonious Monk?" and he hummed a pentatonic scale, going up. Then he said, "Sonny Rollins?" and he hummed the same thing again. He went through a whole group of jazz musicians, always singing the same scale going up. Then he said, "Jaki Byard?" and he hummed the same scale going down!

APPLYING DIMINISHED SCALES TO JAZZ

Andy LaVerne

Here are two ways to use the diminished scale.



DEVELOPING SOLOS

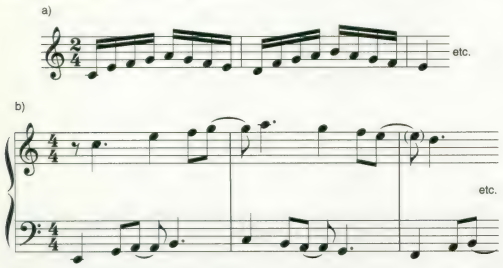
Marcus Roberts

The main aspect of soloing is that you want to construct a statement with a certain type of architecture and logic, much as how a person giving a speech tries to outline certain major points to get across. It's about creating something logical out of chaos. You've got 20 decisions to make every second. One of the decisions involves how to deal with the harmonic and rhythmic form of the tune. You always have to think in terms of the progression, as opposed to the succession, of the chords, so you can imagine a point of arrival over a period of time. If you get to the point where you can tie two choruses together, then there's the question of tying four choruses together, or however many you play in your solo.

HAND INDEPENDENCE

Roger Williams

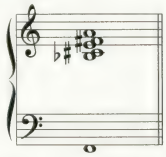
I practice Hanon in every way but the way in which he wrote it (a). For example, I make up paradiddle patterns on Hanon exercises (b). It really helps your hand independence, especially on the off-beats. I play these exercises slowly, one note per second:



VOICINGS

George Duke

Next time you read about Scriabin and his "magic chord," think of me. I've got my own magic chord. It took me awhile to find it, but now I'll let you in on it:



That's it. For me, this is one solid chord. I usually use it as a substitute for a straight F7 chord; to me it makes for a nicer texture.

LIFE AND MUSIC

Herbie Hancock

The life that's breathed into music comes from you. If you shut yourself off from living and concentrate only on learning how to play an instrument, that's just craftsmanship. True music has nothing to do with that. Craftsmanship is the tool, but you get to the music by developing your life. I'm a human being, not just a piano player. I have a family, I'm a husband, a father, a citizen, and that goes into the music. The more I develop my humanity and my sense of being human in society, the more I'll have to say musically. It reflects in the depth of the music you make.

SONGWRITING

Barry Manilow

When I compose, I have a cassette recorder going at all times. I have cassettes going way back. I actually have the tape of me composing "Copacabana." It's fascinating to hear. I listen to the melody actually coming out. It came out almost the first time. The melody was right there, I hardly changed anything. They gave me the lyric — it was by Bruce Sussman and Jack Feldman. We had discussed what they were going to write, and then they phoned it in from New York. I put the lyrics on the music stand, and I played. It was right there the first time, so close that there were just a couple of notes changed in the final version. There are other songs, though — 90-minute cassettes of torture, agonizing over one chord, one note. It's the most frustrating and annoying thing, until the end of the tape, when you finally hear the song begin to emerge.

THE CREATIVE PROCESS

Peter Max

Ever since I started painting, I've painted a lot without asking questions, without having any preconceived ideas — like, "What am I going to paint?" I just get to the canvas, look at it, and say to myself, "It's a clean white canvas, here are 60 colors to my right. Which color do I love now?" And suddenly the wish is there to pick up the yellow-green.

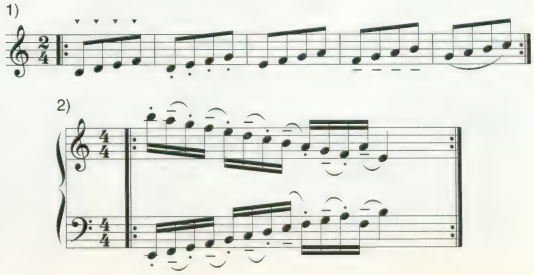
So I pick up the yellow-green and make some strokes. Maybe the strokes will become half the canvas. I just go with the feeling of the moment. Suddenly my mind tells me it's enough yellow-green, now maybe I should have a little bit of pink. Where do I want to put it? I lift the brush. It wants to go somewhere and I follow it.

That discipline of going along with the inner feelings is the discipline of becoming creative. It's the same way with any modern art — even keyboard playing.

ARTICULATION

Jeff Pressing

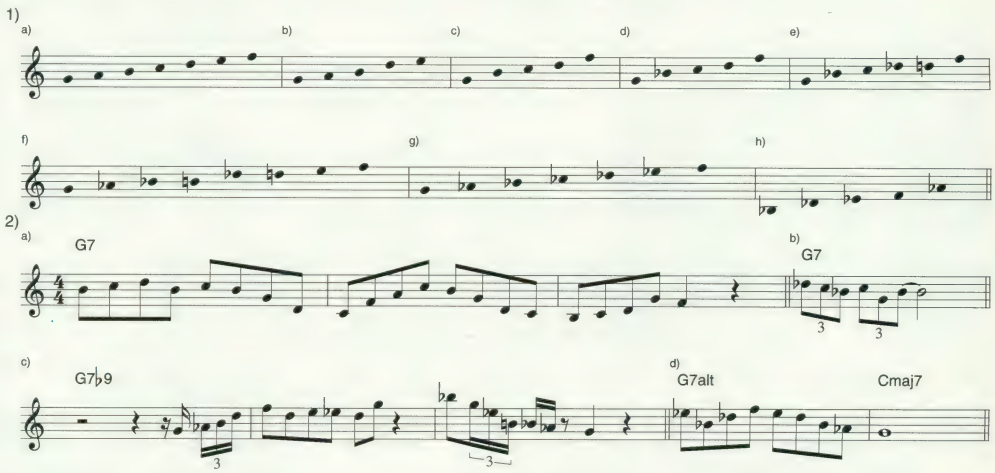
Articulation is the most crucial component of touch when playing a keyboard. Play Example 1 using the articulations indicated, which are, from shortest to longest: staccatissimo (10%-30% of full duration), staccato (30%-50%), non-legato (60%-90%), tenuto (100%), and legato (110%). Then play two-handed scales using mixed patterns of these articulations — use the same pattern in each hand and vary the pattern to create different accents and note groupings (Example 2). The next step involves different articulations in each hand; begin with a two-handed arpeggio or scale with a different articulation in each hand. Once you're comfortable with different simple articulations in each hand, move on to short musical excerpts where each hand can have its own distinct articulation and rhythmic pattern, such as J.S. Bach's *Two-part Inventions*.



DOMINANT 7TH HABITS

T Lavitz

You probably know me for my work with the Dregs. But I've been playing a lot the past two years with a group called Jazz is Dead. We often like to go out on a limb, and we never really know where it's headed. A lot of time we do this over a dominant 7th chord. When I solo over an extended vamp, I don't want to run out of ideas or sound stale. So I like to employ some alternatives to the standard Mixolydian scale (Example 1a). In Example 2a, I've used notes from that scale in the key of G. When choosing an alternate scale, I always make sure it fits conceptually with the music; playing outside in a rock setting isn't always appropriate. Pentatonic scales are a favorite first choice of mine, as you can see from Examples 1b, c, and d. 1b is what I refer to as the country rock scale. 1c was made really popular by the guys in the Mahavishnu Orchestra. 1d is a minor pentatonic. 1e is the blues scale. Moving into more aggressive sounds, 1f is the diminished scale. It's good to use over altered dominant 7ths, such as a G7, 13, ♯11, with a ♯9 or ♭9. 1g is the ascending melodic minor scale, beginning a half-step above the root of the dominant 7th chord. Getting farther from a relaxed sound is 1h, which I look at as a minor pentatonic beginning a minor third above the root of the dominant 7th chord. Don't hang on to this scale; use it just before the release to a I chord. Example 2b is a brief blues scale lick. 2c starts off with a run from the diminished scale (1f), goes into a Mixolydian lick with an added ♭13 in the second bar (1a), and ends with an arpeggio from the ascending melodic minor scale (1g). 2d shows how I'd use the scale in 1h to resolve to a I chord.



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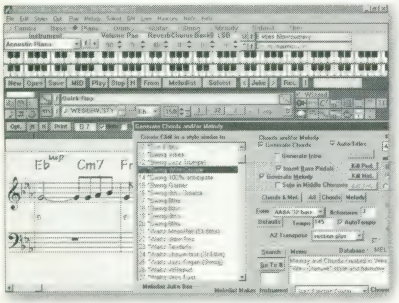

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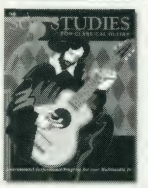

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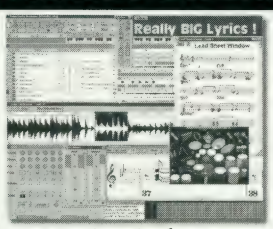

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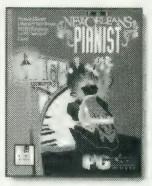

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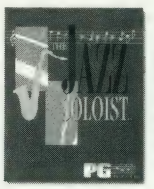

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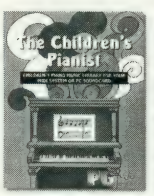

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25 Ways to Stretch Your Music Production Chops

by Mitch Gallagher

No matter how good we are with our instruments or how skilled we get in the studio, most of us are always looking for ways to get better, to broaden our range, to increase the options available to us creatively. It's easy to feel stalled, especially when you only have limited time to create due to deadlines or intrusions from the real world. You may start to feel closed up, as if the idea well has dried up and will never start flowing again.

We've all been there! The next time you start feeling like you want to stretch your skills, or are feeling creatively blocked, give one of the following ideas a try. Some are new, some are time-tested. Regardless, each should open up fresh creative avenues for you to explore as a musician and as an engineer or producer.

1 Overdub a drum or percussion track at half or double the song's tempo. You'll find that the feel of the piece has been altered radically. If you're not using live drummers or percussion layers, try to find a sampled loop that's at half or double tempo (or tempo-shift a loop that's close to the right tempo). Experiment with running it for the entire song, or just drop it in for certain passages.

2 Chop it up. With today's MIDI and audio production tools, we have tons of options available to us for editing our music. Try chopping things up and recombining them in different ways. You can do this on a "macro" or arrangement level — re-order verses and choruses — or get closer in, chopping up musical phrases and sticking them back together. I like to get even more micro: Try taking a sustained audio sound, such as a guitar chord, and chopping it up based on a rhythmic grid; eighth-note resolution often works well. Recombine the eighth-note chunks in a new order, and add a short crossfade between each chunk to smooth the transition (or don't crossfade for a pronounced rhythmic effect). The result is a new, unnatural version of a traditional sound.

Try recording the reverb effects for a part onto a separate track, then chop up the reverb tail using a rhythmic grid as described above. This time, instead of recombining the slices, try deleting selected pieces. The result is similar to a rhythmic echo effect, but with a fresh sound because the "echoes" consist of decaying reverb ambience rather than delayed dry sound.

3 Pick a piece of music you've always loved, and create a new version. A great way to stretch your chops is to look at what the masters have done, and to create your own version of their work. A common choice is to make an electronic version of a classical piece, but why stop there? There's lots to be learned by dissecting and recreating music in just about any style. If you're not into electronics, create a bluegrass version of a heavy metal tune, or turn an improvised jazz piano solo into an orchestral opus.

If you don't want to create a new version, try faithfully duplicating a production you admire. Focus on getting absolutely every detail and tone right. You'll be surprised at what you can learn.

4 Try a new miking technique. We're all taught, or have read about, the standard microphone techniques and choices for a particular instrument or situation. If you're looking for a new or different sound, experiment with breaking the rules and going beyond the conventional choices. Who says that you have to use the front of a cardioid-pattern microphone to capture the sound? The frequency response of cardioid and other directional mics varies widely as sound enters them from different directions. Try pointing the back of the mic at your sound source. Not only will you get a strange frequency response on the primary sound, you'll also capture unusual room sounds from the front of the mic.

Speaking of room sounds, try recording in an acoustically "wrong" or weird space. If you're working at home, you probably have a number of choices to work with: Try the bathroom, kitchen, garage, basement, anywhere that has a "sound." Don't worry about acoustically treating those spaces, it's the sound of the room that you're after.

Use the "wrong" microphone for the job. Who says that you have to put a Shure SM-57 on your electric guitar amp? Try a cheap Radio Shack special or a boundary mic.

5 Transpose a sampled sound way out of its normal range. Moving a sampled sound higher or lower than its normal range will often radically alter its sonic texture. I've had good luck, for example, transposing drum hits *way* down (often many octaves): It's amazing what textures live inside a single drum hit when you push it down far enough. The fundamental starts to drop out, and rhythms and tonalities start to emerge in the upper partials. You'll also start to hear artifacts created during the transposition process (aliasing and other anomalies). Don't try to minimize these "problems"; they're exactly the kinds of character you want added to the tone.

I use a software sample editor to do this rather than a sampler. If you can't transpose far enough in one shot, continue transposing the results until you achieve the effect you want.

6 Add some randomness to the process. Choose your synth patches for a piece by rolling dice or using a random number generating program on your PC. Use random techniques to create the notes in a chord or melody. (You'll gain the added benefit of being able to tell your friends that your music is based on "aleatoric" techniques — won't they be impressed?)

If you're not into randomness, try ordering familiar material in a new way. Back in the 20th century, classical composers used serial or 12-tone techniques that can be interesting when applied to other styles of music. (Visit

your library for books on these compositional methods.) I've had good luck generating source musical material using mathematical and other ordering techniques. For example, I composed a cycle of pieces based around tone rows generated using the Fibonacci number series.

You can take this as far as you like, completely serializing a composition, or just use it for a few aspects of the music. I like to generate the raw material, such as the scales and chords for a piece, by using random or ordering techniques, then compose the rest of the music and arrangement by ear or using other non-ordered methods.

7 **Incorporate a sound, melody, harmony, or instrument that's alien to the style of music you're working on.** Working on an industrial synth-based piece? Make bagpipes a big part of the arrangement. Putting together a smooth, contemplative new age tune? How might you incorporate a heavy-metal, electric-guitar-of-doom part? Maybe the violins in your orchestra should be processed with a ring modulator or vocoder.

Musically, try stretching the vocabulary of the style you're working in. Incorporate extended jazz chords into a straight-ahead rocker. Go to the classical world and steal a progression or two. How might a French sixth chord fit into a country tune? Experiment with resolving progressions "incorrectly." Maybe a diminished chord shouldn't resolve in the traditional classical sense. Maybe a secondary dominant shouldn't resolve at all. Remember your classical counterpoint training? Break every voice-leading rule your teacher drilled into you. (Admit it, you've wanted to do it for years!)

8 **Reverse a sequence or an audio track you've been working on.** If you're working with MIDI tracks this is easy: Most sequencers can reverse a passage instantly. You'll be rewarded with new melodies, new accent and dynamic patterns, and fresh rhythms. If you reverse audio tracks, you'll get the added benefit of reversing the envelope of the sound on the track. If a reversed sound isn't what you're after, learn the reversed part and record it as a new performance.

9 **Limit your tool palette.** When mixing, try outlawing the use of reverb. Create a mix without using any compressors or gates. Turn off a synth module that you tend to use a lot.

Musically, identify a sound that you tend to rely on (cymbals, strummed acoustic guitar, snare drum, or whatever) and record without it — it worked for Peter Gabriel. I've had success substituting an unusual instrument for the conventional choice. One piece I just finished uses a djembe struck with brushes in place of a snare drum, for example. The result is just different enough to give the track a fresh sound and feel.

Try recording without listening to certain backing tracks. Working on a pop tune? Track the backing rhythm parts (drums, bass, rhythm guitar) as usual, then mute one of them while recording later tracks. The results can be interesting. You might need to go back and re-compose/-record the earlier parts, but who cares if you end up with something cool?

These days, those of us who use hard disk-based recording and mixing systems are accustomed to being able to automate and tweak things at a microscopic level — it's easy to tweak a part to death. On your next mix, try turning off the automation and mixing manually with your mixer. If your rig doesn't allow this, try using a fader box or control surface to enter automation rather than a mouse. If all else fails, you may be able to remap a synth's mod wheel to "perform" some mix moves manually.

10 **Transpose MIDI sequences that play mapped instruments.** MIDI drum parts are clearly the prime contenders for this type of thing. Transpose the MIDI notes playing a drum kit up or down a step, and you'll get something completely different: The kick drum will be playing a snare, the hi-hat playing the toms, or whatever.

But don't stop there. Also experiment with taking a MIDI piano, organ, or string passage and changing the patch it's playing to a percussion or drum kit part. The rhythm will stay the same, but the melody and chords will be converted into a pointillistic *klangfarbenmelodie*. (Impress your friends, use the classical term.)

11 **Become a power user — or don't.** Take one piece of gear or software in your rig and learn it inside-out. Really get inside and figure out everything that you can do with it. Comb the Web and other resources for new ways to use it, or tips and tricks you might have missed. (See 411, Dec. '99 for more on becoming a software power user.)

Or, conversely, be an "anti-power user." Borrow a friend's synth or processor and use it on a track without getting familiar with what it can do. Randomly push buttons and make tweaks. Don't be afraid to make mistakes or to use the piece in the wrong way.

12 **Write some music on an instrument that uses a playing technique totally different from your main axe's.** If you're a keyboardist, compose on an electric bass or a mandolin. If you're a guitar player, compose on a keyboard. Who cares if you can't play the instrument well? The idea is to get a fresh perspective on the music and to avoid the habits imposed by your technical limitations.

If you tend to compose and arrange at the keyboard, take a stack of music paper to the beach and write a piece using only your ear. This is a great way to avoid technique or idiomatic issues entirely — plus, it's great ear training!

13 **If you play an electric instrument, make some music with an acoustic instrument, and vice-versa.** If you're a keyboardist, don't just switch your synth to an acoustic grand sound and assume that you've done the same thing. Make the effort to find a real acoustic piano you can sit down at and play or write. If you normally compose on an acoustic guitar, try picking up an electric. While in most cases your technique will transfer largely intact, the sound and limitations/abilities of the new instrument will bring out different things in your playing and writing. For example, note sustain and timbre are by nature more limited on an acoustic piano than on most synths; you have to approach playing one differently than you do an analog synth patch or a sampled string sound. Take what you've learned back to your regular instrument and apply it there.

14 **Quantize heavily with unusual parameter settings.** Take a MIDI part that's been recorded with a straight-eighth feel and quantize it using triplets or a five-in-the-space-of-three setting.

Don't limit yourself to just rhythmic quantization. Many sequencing software packages allow you to extract dynamics and other aspects of a groove and apply them to a new part. Try taking the accent pattern from a triplet-based swing part and applying it to a straight-eighth passage.

15 **Create a piece of music in a style, or using elements of a style, with which you're completely unfamiliar.** Most of us have favorite styles we tend to work in; maybe you only work in one style of music. Try venturing far afield from this comfort zone. If you're a jazzer, write a down-home country piece. R&B where you normally live? Compose and produce a classical piano solo. Really try to get in and learn what makes the

new style work. Examine the sounds, melodies and harmonies, production techniques, and arrangements. Pick up a few representative albums in the new style and live with them as your exclusive listening music for a few weeks; absorb as much as you can. When you return to your chosen style or styles, you'll find your perspective has shifted slightly. What can you incorporate from what you learned by doing this exercise?

16 **Exaggerate dynamics, arrangement contrasts, and other characteristics of the music.** So much of today's music is compressed and processed to the point of being two-dimensional; this is affecting us as listeners, players, and recordists. Take a look at what you can do to break this trend. As a performer, try pushing the envelope of your performances to the point of caricature: Make the forte super-loud, the pianissimo almost inaudible. Create huge crescendos and dramatic ritards. If nothing else, when you go back to performing with normal dynamics and articulations, your sense of the dramatic will have been heightened.

Similarly, as an engineer/producer, try contrasting super-wet, effected passages with bone-dry parts. Try creating contrast by equalizing parts dramatically, or by muting certain tracks (such as synth pads or acoustic guitar strumming) that would normally play throughout a song.

17 **Put MIDI controllers to work.** Over the years, there have been a lot of complaints about electronic music. A common one is that it's rigid and machine-like. Listeners and players alike have complained that electronic instruments aren't as expressive as acoustic instruments. But few of us really use all the expressive capabilities built into our synths and processors. Try emulating an acoustic instrument performance, such as a guitar or sax solo. Are you really bending notes the way the guitarist does? Listen to how the sax player brings in vibrato; is that the way you're using your mod wheel? Even if your goal isn't to realistically emulate acoustic instruments, the performance techniques you learn will bring more life to your playing.

Want to go further? Program new controller responses for your synth sounds, and then use every available controller on every sound. Go beyond typical pitchbend, mod wheel, and aftertouch and venture into the unusual. What kinds of wild controller routings can you come up with?

18 **Do something that goes against the first thing that comes to mind.** We all have habits that we fall into, whether playing habits with our instruments, compositional habits as we write, or production habits in the studio. The next time you're working on some music, slow down and pause before making a decision. Rather than do what you always do, think consciously, and do something different. Maybe you always use reverb on lead vocals. Try using a delay or no effects instead. If you normally build a mix starting with the kick drum, start with the rhythm guitar. If you always reach for a small-diaphragm condenser mic for acoustic guitar, try a large-diaphragm dynamic model instead. (Remember that some mics are fragile — don't get *too* carried away.) If the first thing that occurs to you is to put strings behind the vocals on a ballad, don't! Choose another sound or instrument, or use nothing at all. If your usual technique on a rock tune is to double the electric rhythm guitar part, try something different: Use an acoustic guitar. Play a contrasting part in another register. Play countermelodies instead. Only double specific notes instead of the entire part.

As a player and composer, avoid the chords, scales, and licks you usually use. Try to play a solo without using any pre-learned licks at all — improvise a melody instead.

19 **Score to picture. Then get rid of the picture.** It doesn't matter if your rig doesn't let you accurately sync your recorder or sequencer to your VCR. We're not after frame-accurate film scoring here. Rather, we want to draw inspiration from what we're seeing. Push the Start button on both machines and play along with what you see on the screen, trying to express what you're seeing in the music you're performing. When you've got some music together, shut off the VCR, and listen to what you've created; does it evoke the feelings and images you want in your head?

Not into movies? Choose an artist whose work speaks to you and compose a series of pieces based on his or her work. (Hey, it worked for Mussorgsky!) Interpret what you're seeing visually as sonic textures, melody, harmony, and rhythm. It's easy to be insular, with music as the only artform you draw from. Take a look out into the wide world of art for other sources of inspiration.

20 **Take time away from your main instrument.** Often you'll find that when you come back to it, you'll have fresh ideas and techniques to try. This can work with your studio as well as your instrument; take a complete break from production and do other musical things once in a while. If you've spent weeks or months tracking parts for a song, take a week or two off before mixing. When you come back, you'll find you have a fresh perspective.

Try doing the opposite, too. Take some time (a week or a year) to practice your main instrument without worrying about composing or recording. Really focus on improving your playing. Then come back to your writing or recording and apply the new things you've learned.

21 **Over-process a sound.** We're constantly told to be conservative with audio processing, especially EQ and compression. And in many cases it works well to use "pure" production techniques and values. But if you're after new or different sounds, break the rules. Equalize the heck out of a track, if you feel that's what is called for. "But I read an interview where [insert famous engineer's name here] said never to boost EQ by more one or two dB. . . ." Great, that's what works for that engineer, and in most cases it's probably solid advice. But aren't you after what works for you and what will improve your productions? Don't be afraid to crank those EQ knobs! Squash a part or a mix completely with a compressor. Set the compressor so that it pumps and breathes — it may be just the effect you need to make your tracks sound the way you want. What's the worst thing that can happen? You get a sound you don't like, and you have to turn the knobs back where they were — so what? Learn to process tracks based on the sound that you want, not on where the knobs are set or how the "experts" say it should be done.

22 **Load a bank of new or different patches into your synth.** In the Oct. '99 Studio Sense on working efficiently, I recommended creating a standard set of patches for use as a composition template. Now I'm recommending doing the opposite: Throw out your "regular" patches and samples and load up a new, completely different bank. (I know, I know, make up your mind already.) Give yourself a fresh palette of sounds to choose from and see what you come up with when using them for composing and playing.

23 **Collaborate with someone.** This is especially important if, as is increasingly common these days, you normally work on your music entirely alone. Try finding musicians, engineers, and producers who work both in your usual style of music as well as those who come from a completely different style. What can you learn from each other (even if you disagree about everything)? ➥

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KEY INFO #119

Try not to assume your "traditional" role. If you're usually the engineer on sessions, for example, let someone else handle the technical aspects of recording while you concentrate on the musical areas. As hard as it might be, refrain from commenting too much on what the other person is doing or offering suggestions for how they might improve their part of the collaboration — concentrate on what you're doing and contributing. When the session or song is finished, sit down and talk about the results and offer each other constructive commentary.

Don't have anyone in your town to collaborate with? Get on the Web and start looking for others in similar situations. It's easy enough to email files or ship ADAT tapes or floppy disks back and forth. Soon, with technologies such as that coming from the Rocket Network (www.rocketnetwork.com), you'll be able to collaborate online in real time.

24 **Force an instrument or sound to play a role in the arrangement that it wouldn't normally play.** Give the high melody to the tuba. Use a strummed bass instead of an acoustic guitar. Use alternate or extended playing techniques to stretch what an instrument can do. Create percussion parts by thumping on an empty soda bottle. Use an E-Bow on a lap steel guitar to replace a string pad. Look around your studio and get creative! Pretty much everything in there will make some kind of sound if you scrape, tap, or smack it with your hands, head, or other convenient appendage.

Go for what works for you and it will improve your productions. Don't be afraid to crank those knobs.

Pick up a set of drumsticks or percussion mallets and start banging away on your instruments, furniture, and gear. (The standard disclaimer applies: Neither I nor *Keyboard* is responsible if you get carried away in your musical/sonic explorations and break or damage something.)

25 **Get out of the studio.** It's easy to get completely absorbed in what you're doing and to forget that there's a big world out there. Without waxing rhapsodic, sometimes the best thing you can do for your music and production chops is to get out and live a little bit. Most of us find that the more balanced our lives are, the more creative we can be. Don't use this as an excuse for procrastinating, but definitely step out and forget about this stuff once in a while — your music will be better for it. ■

Mitch Gallagher is the senior technical editor of Keyboard *and also the editor-in-chief of* Make Music Now. *No, he still hasn't finished his CD. Stop asking. . . .*

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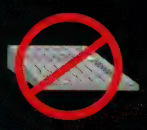

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98 Yamaha S80
106 Clavia Micro Modular
112 Yamaha SW1000XG
120 Roland SRV-3030
124 Short Takes:
Akai Headrush E1
Antares ATR-1
Adaptec Easy CD Creator
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128 Sounds

The Bottom Line

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Yamaha S80

by Ernie Rideout

EXPANDABLE SYNTHESIZER & MASTER CONTROLLER

Master controller keyboard and expandable synthesizer.

Pros: Expandable synth architecture. Excellent sounds and keyboard action. Resonant filters. Good effects. Extensive MIDI continuous controller mapping. Lots of arpeggiator patterns.
Cons: Operating system not easy to learn. Zipper noise on realtime EQ knobs. No user arpeggiator patterns. No dedicated arpeggiator on/off button. Small LCD. Only one MIDI out.
Bottom Line: The S80 is a lot of fun to play. The keys are solid, comfortable, and responsive, and the sounds really connect with the action. The main piano sound is truly great, and the rest of the keyboard sounds are right up there, too. With the resonant filters, the synth sounds come alive. The voice editing is very deep, much more so than on your garden-variety under $2,000 88-note controller. Add the arpeggiator and the modular plug-in expansion architecture to that, and the S80 becomes a synth powerhouse. The controller routing is unusually deep and flexible, too. With all wheels, sliders, and knobs transmitting their own multi-destination assignable MIDI messages, you'd think that the S80 was striving to take the place of its discontinued controller sibling, the KX88. But with only one MIDI out, the S80 may be less able to control an extensive rig than some other controllers on the market.

I felt that the operating system left a lot to be desired in terms of the process of setting up multiple zone external control configurations – with all those menus, it was just taking me longer than I'd like to whip up a new configuration and save it. That said, the way the master keyboard functions overlay the multitimbral Performances is quite clever. Overall, this is a great instrument with significant advantages over other instruments in its price range – that's why we've given it the Key Buy award. I urge you to give the S80 a try, and check out some of those expansion boards while you're at it.

Yamaha, 714-522-9011, www.yamaha.com

$1,999

The controller keyboard market has sure heated up lately. It used to be headline news when anything with 88 keys broke the two grand price barrier. Now there are several such instruments on the market, aimed at gigging folks who haul their own gear. The good news is that you have enough choices to be more likely to satisfy your taste in keyboard action and sounds.

Especially with the arrival of Yamaha's S80. Its action is built to be dug into, its sound set is optimized for live keyboard work, and its real-

time controller capabilities are unusually extensive. Also, it doesn't weigh too much — the final ingredient for cooking on the bandstand.

But the S80 has a hidden personality: It's a full-on programmable synth, complete with multimode resonant filters, an arpeggiator, all the envelope generators you'd want, and matrix modulation routings that'll have all your limbs working overtime twiddling with pedals, knobs, and sliders.

For a nominal price, you can add even more personalities to it. Two expansion slots accommodate Yamaha's PLG150-series expansion boards, which do way more than just add new waveforms (see "The Expansion Options," page 100). Adding one of these boards is like shoving an entire new synthesizer into the S80. But even without the expansion boards, there's a lot going on with this instrument.

Vital Stats

Dimensions/weight	52" H x 14.5" D x 6" H. 53 lbs.
Keys	88 weighted, hammer-action keys, velocity and channel aftertouch
Synthesis type	sample playback (other types via expansion boards)
Polyphony	up to 64 notes with internal sounds; up to 192 notes with expansion boards
# of multitimbral parts	16
# of splits and layers	4
RAM/ROM presets	256 ROM Voices (patches), 128 user Voices, 8 ROM drum kits, 2 user drum kits; 128 user Performances; 553 waveforms (24MB)
# of oscillators per patch	up to 4
Oscillator sync	yes
Filters	1 or 2 per oscillator; highpass, lowpass, bandpass, band elimination, combination filters; all resonant
LFO	triangle, sawtooth up, sawtooth down, square, trapezoid, sample & hold 1 & 2; 1 per oscillator, 1 global
Envelopes	pitch, filter, and amp for each oscillator; up to 6 segments
Syncable functions	arpeggiator, LFOs, tempo-based effects
Sound expansion	2 slots for user-installable expansion boards
External storage	Smart Media cards, sys-ex
Effects	reverb, chorus, insert effects processor (118 algorithms)
Audio I/O	four 1/4" unbalanced outs (L/R and 2 direct, –10dB); 1/4" unbalanced analog input with gain control (mic, line, and guitar level)
MIDI I/O	in, out, thru; serial port
Headphones	1/4" TRS jack
Control inputs	4 pedals, 1 breath control
Performance controllers	2 wheels, 4 sliders, 5 knobs; all assignable, all transmit MIDI; sliders and knobs can have up to 6 destinations
Arpeggiator	128 patterns, transmits MIDI, syncable to MIDI clock
Options	expansion boards: PLG150-XG, $249.95; PLG150-PF, $349.95; PLG150-DX, $349.95; PLG150-VL, $299.95; PLG150-AN, $299.95; PLG150-VH, $169.95.

Keyboard

This is one nice keyboard action. The keys have just the right amount of planing on the ends of the white keys and the sides of the black keys to be comfortable. The texture of the plastic is inviting to the touch — not too grainy, not too slippery. The keys have a weight that feels very close to a hammer action, and they respond quickly, as though counterbalanced. Repeated notes? No problem. Sequencing drum patterns? Your fingers will feel like they're right on the heads, pads, or knobs, depending on what kind of drums you imagine you're playing.

I found the connection between the sounds and the keyboard to be quite believable, musical, and satisfying. Playing the main piano sound as softly as possible, I was impressed by the similarity of the response to that of my acoustic piano. On sounds that respond closely to velocity (such as synth sounds with filter frequencies that shift according to how hard you play), the keyboard-to-sound connection is fantastic. This is what makes this instrument so much fun to play.

Four keyboard velocity curves are available, plus a fixed, one-velocity-fits-all organ setting. The curves themselves are not adjustable. Though the keyboard transmits only velocity and channel aftertouch, you may be fooled into thinking you're playing with

With such a clean front panel, the S80 seems to be a fairly basic, under-$2k controller keyboard. Well, don't believe it for a second: The wheels and sliders to the left of the LCD can be assigned to up to six destinations each, as can the five dark knobs under the display. What's to control? A heck of a lot more than just Wurly tremolos and Leslie ramp-ups, that's for sure. The synth engine is similar to that of Yamaha's robust EX-series instruments (reviewed Dec. '98). To the right of the LCD are mode and editing buttons; the inclusion of an effects bypass and a store button are most welcome. The buttons on the far right are for selecting storage areas, banks, and sounds — but they also assume unlabeled multifunction duties once you get into the editing modes. On the back panel you'll find the expansion bay and card slot (see "The Expansion Options," page 100), as well as the expected array of connectors. I was disappointed to see no multiple MIDI outs, but I was happy to see a dedicated breath controller input.

THE EXPANSION OPTIONS

The S80's expansion bay holds two postcard-sized boards; installation takes about 30 seconds for each. What you get from adding an expansion board depends on which one you select. The PLG150-AN board (**$299.95**), shown on the left, is essentially an entire analog physical modeling synth, complete with its own arpeggiator, resonant filters with self-oscillation, and five voices of additional polyphony. You can sync the arpeggiator to MIDI, and even trigger it from the S80's internal arpeggiator – let's see you calm the neighbors down after they get an earful of those sounds. Combined with the numerous internal synth patches, the sounds on the board will give you quite an impressive analog synth sound arsenal. The board on the right is the PLG150-VH (**$169.95**), an effects board that appears in the S80's architecture as an insert effect. Using incoming audio from the S80's A/D input, it provides up to three-part, MIDI-controlled, formant-corrected harmonies and detuning. Other available boards include the PLG150-XG (an XG- and GM-compatible multitimbral synth, **$249.95**), the PLG150-PF (piano and electric piano sounds, **$349.95**), PLG150-DX (a DX synth on a card, **$349.95**), and the PLG150-VL (a wind instrument physical modeling synth, **$199.95**). Adding a synth board increases the multitimbral parts, polyphony, and sometimes the effects available on the S80. An editor program is supplied with each board, although the S80 comes with XGworks and other sound editing software. By adding the DX and AN boards to the S80, you can combine sounds from each of those sound generation technologies with the sample-based main sounds. Note SmartMedia card slot to the left of the bay.

polyphonic aftertouch, thanks to the synth engine's polyphonic portamento and the feel of the velocity-sensitive filters.

Sounds The S80's sound set is heavily stacked in favor of keyboard gigging and analog synth emulation. There are an adequate number of other sounds, enough that you could make this instrument the centerpiece of a MIDI sequencing environment, as long as you had some help in the orchestral area.

The main piano sound ("StereoGrnd") is fantastic. It's beautifully sampled and voiced. When I play it, I have no sense that its dynamic range is the result of simple changes in volume or filtering. The notes in the extreme registers are musical, not shrill or strident. There are several other acoustic piano samples onboard, and I enjoyed playing them all in whatever style the sound called for. "The midrange and highs are convincing," remarked associate editor John Krogh. "I find the lows to be a little digital, but overall the sound is very nice."

The electric piano sounds rock, to be blunt about it. From spunky Rhodes patches to shimmery FM electric pianos, you have a continuum of sounds to cover most any groove. An essential aspect of the success of these sounds in particular is the ease with which you can adjust the timbre and effects: Several of these ("ErlyFusion," "19 Roadz," "RT Roadz") are covered in lusciously thick chorus or fat auto-wah, which you can tweak by twisting one of the knobs. You can also get a markedly different sound by adjusting one of the three EQ bands assigned to realtime knobs A, B, and C.

I'm too much a fan of real organs and dedicated drawbar B-3 emulators to really enjoy playing sampled organ sounds. But I must say that I'd be able to cover my gigs just fine with the organs on the S80. There are enough drawbar and Leslie variations to do the job. "Soft Rock" in particular combines three elements, one with a setting that sounds like 88 8000 000 and another of 00 0800 000; by pulling the volume of the former down with the realtime sliders, you have what you need to get through all those Al Green tunes.

Did I mention that the synth Voices knock me out? Well, they do. The wide variety of samples (oodles of Minimoog basses, OB pads, ARP leads) combined with the rather deep mod routing, envelope-to-velocity scaling, and resonant filters make these Voices a real gas to play. That and the fact that this instrument is a real synthesizer. You have envelopes for amplitude, pitch, and filters, completely programmable per oscillator. With four oscillators per Voice, that makes for some mighty decent flexibility for sounds that evolve over time and across a range of velocities.

We don't have enough room to get into all of the parameters, but some of my favorites include programmable filter scale offsets and break points for dialing in particular filter effects, pitch envelope scaling for getting into some really bizarre tuning instability, LFO phase and fade control, a syncable global LFO, polyphonic portamento . . . you get the picture. Couple this with the effects and the arpeggiator, and you have some remarkable synth power.

Among the many other types of sounds available on the S80, I'd like to single out a few to give you an idea of the playability of this instrument. "Voodoo Man" is the best electric guitar patch I've ever played on a synthesizer. It combines a touch-sensitive filter with distortion and delay in a way that made it nearly impossible for me to stop playing it long enough to finish writing. "This sound is jacked up," raved John Krogh. One of the synth brass patches ("Moon AT") sparkles, and then opens up in a crescendo when you apply aftertouch. The FX Voices, especially "Rosie" and "Rising," show off the arpeggiator and pitch envelope capabilities of the synth quite nicely.

Performances are the S80's multitimbral setups, as well as its layers and splits. They allow you to create offsets for envelopes and other Voice parameters without actually editing the Voices. Many of the factory Performances are programmed with great arpeggiator or drum patterns, while others are designed to show off interesting aspects of split and layer programming ("Bass/Piano" for example, features hi-hat accents on certain keys to contrast with the ride cymbal normally layered with the bass patch). Due to the S80's labyrinth of editing pages, though, it's not that easy to create your own Performances. Sure, once you've figured out that in order to create a split you must first turn on the "layer" function for each part, you'll never have to learn it again. But it's not what I'd call intuitive.

In the course of working with the S80 and a MIDI sequencer, I found no reason to

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fear note delays caused by maxing out the polyphony. Several pre-programmed multitimbral setups help ease an otherwise unwieldy sequencing environment.

Arpeggiator The S80's arpeggiator can be assigned to an individual Voice, or to individual parts in a multitimbral Performance. The 128 patterns come in four types: straight sequences, phrases that emulate instruments, drum patterns, and control patterns for gate time and other effects. You can't create your own patterns, but you can program tempo and note range limits, determine the response of the arpeggiator to velocity, and set the gate response and the basic time unit. The arpeggiator has a hold mode, too. A couple of bummers are the omission of a dedicated arpeggiator on/off button, and the fact that some patterns hesitate slightly upon retriggering when used with certain patches. The variety of patterns is inspiring, though. The drum patterns in particular make for some very interesting ensemble Performances.

Effects The S80 has a wide arsenal of effects. Per Voice and per Part in a Performance, you can assign one or two insert effects, in any order in series, or in parallel. The insert effects available range from the expected chorus, flanger, and phaser types to some pretty outrageous amp simulations, touch-sensitive wahs, rotary/distortion combinations, and even more bizarre sound-mangling effects. Once processed by the insert effects (or not), the signal passes through global chorus and reverb effects.

I found the quality of the effects to be quite good, especially for synth and keyboard sounds. I love chorus with enough depth to make you lose your equilibrium, and the S80 has it. The delay and panning algorithms are more than adequate to add movement to your sounds as well — again, within appropriate boundaries for keyboard sounds.

If you want to get out of bounds, though, you can. The S80 has an analog audio input (mono only) that can be routed through the insert effects. It accepts mic, instrument, and line-level signals, so you could play a real guitar through that "Voodoo" setup mentioned earlier, and have your signal come out the main or individual outs on the S80. Good news: tempo-based delays are syncable to MIDI.

There are plenty of EQ options on the S80. Of the five bands available globally, three are assigned by default to the realtime control knobs, at least on the unit that I used. This is great for setting the EQ to match the acoustics of a venue. I anticipated using these in real time, but it turns out that the EQ exhibits hideously loud zipper noise when you turn the knobs. If you want to make EQ sweeps for dance tracks, re-assign the knobs to resonance and filter cutoff. In addition to the global EQ, each Voice has a two-band and a single-band parametric EQ available for balancing Voice elements.

Controller Features

The S80's knobs, wheels, sliders, foot pedals, and aftertouch can be assigned to modulate lots of different destinations. In fact, each Voice can have six different physical controller/destination configurations. This means that one slider can have six distinct destinations, from effects parameters to continuous controllers to program change messages. A single destination, conversely, can be controlled from six separate physical controllers. I wouldn't recommend going that

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far, but if you want to control vibrato depth with the mod wheel and a foot pedal, you can.

That's fine for the internal sounds, but what about the rest of your MIDI rig? The S80 has an interesting approach to external device control. As a four-zone controller, it performs all the functions you'd expect from a fairly sophisticated controller: octave, transposition, note limits, and physical controller transmit assignment and status. Such functions are configurable per Performance. But those functions aren't active until you push the Master Keyboard button. This means that you can set a Performance so it responds one way when you use it with your MIDI sequencer, with its own part settings for transpose, note limit, etc., and another way entirely when you engage the Master Keyboard mode. The Master Keyboard settings for zone, split, and layer override the part settings of the original Performance. Whether the Master Keyboard mode is engaged or not, the following information is transmitted via the MIDI out port: note on/off, velocity, aftertouch, pitch-bend, modulation, and arpeggiator data.

Do I like this system? Well, I'm used to making all settings for internal and external zone control in one setup and forgetting about it. Other than having to deal with the fear of jumping into the first tune of a set without having engaged the Master Keyboard button, I think it's a clever and flexible approach. Just don't expect to control a really big MIDI stage rig with only one MIDI output.

Operating System

My only real problem with the S80 is that with all of these operational modes and programmability, it's often not easy to find the parameter you're searching for. Which page was that arpeggiator switch on? What mode do I need to be in to create a split? The two-line LCD does little to provide assistance, and the Bank/Voice select buttons similarly give no visual clues as to the nature of the multiple functions that come into play in the various edit modes. You'll learn the shortcuts soon enough, though, or you can use the included sound editing software. The S80 ships with XGworks as well (see page 112 for more info).

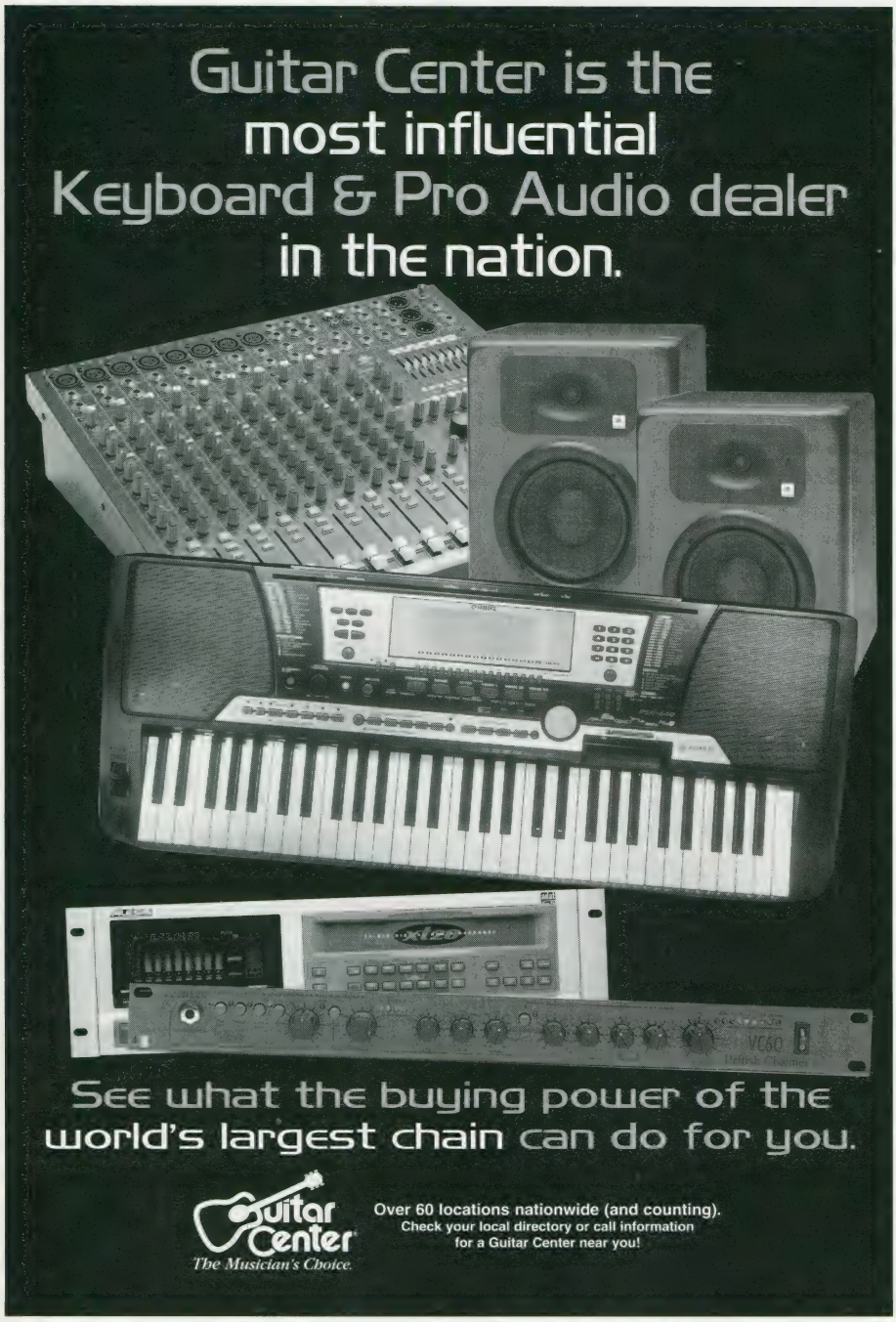
Those misgivings aside, the Edit Menu function is a nice touch. When in any edit mode, you can get a menu of all the parameter categories available to you by holding the Shift button and turning the Page knob. Then you can use the Data knob to scroll the cursor to the category you want. This is very helpful for navigating through the scores of edit pages you'll encounter as you learn the ins and outs of the S80. A "search" feature available in Performance mode makes it easy to scroll through Voices of only the same general type. Praise also for the inclusion of two front-panel buttons: Compare and Effects Bypass.

Storage

Have you worked with any devices that use Smart Media cards for data storage? The S80 does, and damn, they're cool. Tiny little things, they feel about as sturdy as a corn flake and fit on a 50-cent piece, but they sure hold a lot of data. Data contained on them appears instantly in the S80's menu; no loading time. Not too expensive, either; $40 will get you a healthy-sized one. ■

KEY INFO # 120

Having recently relocated to New York City, associate editor Ernie Rideout is enjoying exploring the Right Coast scene.



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Clavia Nord Micro Modular

VIRTUAL ANALOG SYNTH

by Jim Aikin

Highly configurable mini-synth with editor software for Mac and Windows.

Pros: Completely user-configurable voice design. New modules provide even more synthesis resources than previous Nord Modular OS. Dual audio inputs. Programmable knobs. Extensive sound library available. Editor software now available for both Mac and Windows. Great sound.
Cons: Limited polyphony. Not multitimbral. Requires computer for programming.
Bottom Line: I'm having way too much fun with this synth. It may look like a stompbox, but it gives you all the synthesis resources of its big brother, the Nord Modular. The latter instrument was outrageously powerful to begin with, and the new modules (all of which are totally compatible with the Micro Modular) put it clear over the top in terms of sound power. Naturally, I'd love to have the full-size unit, both for the extra polyphony and for the large bank of knobs. But the Micro offers a real price breakthrough, making it an unbeatable deal. If you're recording your music into a multitrack, the shortage of polyphony won't be an issue: You can overdub synth tracks until the cows come home. Add to that the possibility of using the Micro as a versatile effects processor for vocoding, stereo chorus, ring mod, and distortion, and the verdict is clear: The Micro deserves our Key Buy award.

Clavia, www.clavia.se; U.S. dist. by Armadillo Enterprises, 727-519-9669

$899

Modular analog synthesis is a wonderful thing, but traditional modular synths are expensive, bulky, and hard to use. Modular synthesis implemented in software is way easier to use — but a computer is not the most fun instrument to play or take on a gig. With that in mind, in 1998 Clavia unveiled the Nord Modular (reviewed June '98), a hardware module with real knobs whose sounds can be programmed from a computer. Once a bank of sounds is loaded, you can dispense with the computer and use the module just as you would any other MIDI instrument.

The Nord Modular is powerful enough, and radical enough, that we gave it a Key Buy award. But at $2,495, it's not exactly an impulse buy. Realizing that many musicians want a virtual analog synth mostly for lead lines, basses, and special effects, Clavia has repackaged the Modular technology in a smaller chassis as the Nord Micro Modular. At $899 list, the Micro will run all of the same modules as its big brother, allowing you to do not only virtual analog synthesis but additive, FM, and various hybrid types. It runs rings around the current crop of under-$1,000 monophonic synths, both analog and virtual analog. And it's not just monophonic: Up to six voices of polyphony are available, depending on the complexity of the patch.

Good things come in small packages: The Clavia Micro Modular provides all of the sonic power of the Nord Modular — a completely configurable synth voice with effects and versatile audio processing — at a fraction of the price. Three of the knobs and one button are programmable, but the knob on the left is dedicated to master volume.

The Nord Modular allows some limited reprogramming of patches from the front panel, but you absolutely need a computer to program the Micro. Both Mac and Windows are now supported, however — good news indeed. I programmed the Micro using an older Mac G3, and ran into only one nonrepeatable software crash. We're told that the PC software is functionally identical to the Mac version. And all of the patch programming power of the Modular is available in the Micro, including the ability to process two external audio inputs, and Clavia has a large library of free patches on their Web site, which Micro owners can take advantage of.

There are four chief differences between the units: First, the Modular has four DSP chips (expandable to eight) for generating sounds. The Micro is limited to one chip, with no expansion possibilities. Second, as you might expect from the fact that there's only one chip, the Micro can only play one patch at a time; there's no possibility of layering separate patches or operating on several MIDI channels at once. (Normally, this limitation would be described as "not multitimbral," but with a modular synth you can easily create a single patch that *is* multitimbral, in the sense that it will make several distinct sounds at once.) Third, the Micro's front panel sports a two-digit LED and four knobs, as opposed to the Modular's 18 knobs and two-line LCD. Fourth, the Modular has four audio outs to the Micro's two. Also, the Micro has room for only 99 patches in memory; with its most recent OS, the Modular can reportedly hold up to 500.

In the year and a half since our earlier review, the Modular's software has advanced from version 1.1 to version 3.0. A number of cool new modules were added in version 2.1, including a vocoder, a percussion sound generator, and some new types of oscillators. What's new in version 3.0 is first of all on the computer software side, which now contains a floating knob window (more useful for Modular owners than for the Micro), multi-stage undo/redo, and a patch browser. Even more important, a patch can now contain modules in two areas: the Poly Voice area for modules that should be duplicated for each voice (oscillators, filters, and so on), and the Common Voice area for modules such as signal processors, which should act on the output of the Poly area. This is a sensible arrangement;

it saves on DSP resources, and at the same time makes possible some special effects, such as intermodulation distortion between voices.

In this review I'll recap the Modular concept briefly and then take a closer look at the new stuff. For more details, please see our earlier review; you'll find it at Keyboard Online (www.keyboardonline.com/demos/nordmod/nordmod.shtml).

Overview

Creating new sounds in the Nord Modular or Micro Modular is not too tricky. The main challenge will be learning to "think modular." And with this synth, creating your own sounds is what it's all about — the factory library serves up a lot of useful starting points, but if you don't customize them you'll be missing out on a lot of music power. Even so, the factory set serves up quite a variety: Aggressive basses, struck percussion with lively metallic overtones, exotic self-playing sequence patterns, warm pads, and more. Aside from the limited polyphony, the Micro will do any of the classic analog sounds that the Nord Lead (reviewed June '95) will do, and a whole universe of stuff that the Lead won't do.

The software, which is identical whether you're using the Nord Modular or the Micro Modular, offers a large palette of modules to choose from. All the action takes place in one main window (see page 108). To create a sound, you drag the modules of your choice from the palette into the main workspace and then connect them with "patch cords" using the mouse. One or two of the connections are made for you (notably, some types of oscillators will track a MIDI keyboard), but it's up to you to create both the audio signal path and whatever modulation routings you may need. For example, if you want vibrato, you have to grab an LFO, patch its output into an oscillator's pitch modulation input, and then turn up the modulation "knob" with the mouse.

Each module you add to the patch uses up some of the available DSP "overhead" on the chip. For example, a resonant multimode filter eats up 6.6%. An indicator at the top of the screen keeps track of the total DSP resources used by all of the modules in the patch. This is important, because it dictates your available polyphony. If the patch uses less than 16.6%, you'll be able to play six voices per chip (the Micro has only one chip, as noted above). If the total is under 20%, you'll have five voices; under 25%, you'll have four voices; and so on. The math gets more complicated if some of the modules are in the Common Voice area, but the concept is the same: The total can't exceed 100%.

Vital Stats

OS version reviewed	3.03
System requirements	PC: Win95/98/NT4; Mac: System 8.6, OMS
Polyphony	up to 6 voices (patch-dependent)
# of presets	99
# of multitimbral parts	1
# of splits & layers	patch-dependent
Type of synthesis	modeled analog
Module types	I/O, oscillators, LFOs, envelopes, filters, mixers, audio modifiers, control modifiers, logic operators, sequencers
Oscillator sync	yes
Ring modulation	yes
Frequency & amplitude modulation	yes
Waveforms	saw, pulse w/ adjust, sine, triangle, PW mod, spectrum, formant, percussion, noise
Filter types	resonant multimode, dynamic multimode, static low & high, vocal formant, 14-band bank, EQ
Effects types	vocoder, clip, overdrive, wave wrap, quantize, digitize (lo-fi), delay, sample-and-hold, stereo chorus, phaser, shaper, compressor, expander
Analog I/O	two unbalanced 1/4" outputs, two unbalanced 1/4" inputs
Headphone jack	1/4"
Digital I/O	none
MIDI I/O	main MIDI in and out, host computer MIDI in and out
Footswitch in	none
Performance controllers	3 knobs, 1 programmable button, note trig button, main volume knob
Knobs transmit MIDI	yes
Display	2-digit 7-segment LED
Arpeggiator	none
Internal sequences transmit MIDI	no
Syncable functions	LFOs and sequences (MIDI clock)
Storage	MIDI sys-ex (computer required)
Dimensions/weight	8-1/4" x 4-3/4" x 1-1/2"; 1-1/2 lbs.

The beauty of software-based modular synthesis is that you can use as many or few of each type of module as you need. One patch might need seven LFOs, but only one oscillator and no filter. Another might need six oscillators and three filters to create a single note.

The Micro provides several types of oscillators, filters, envelopes, and LFOs. By using the simplest type that has the features you need, you can economize on DSP resources. In addition, there's a host of specialized modules to choose from — audio mixers, a ring modulator, waveform shapers, effects, portamento generators, logical operators, and step sequencers, to name a few. It would take many pages to give a feature-by-feature analysis of all this stuff. The resources are truly awesome in their depth and breadth. Whether you need a solid bass patch with a little edge, a basic stereo chorus with a little distortion and compression on the side, or a texture generator that plays for hours without repeating and responds to multiple MIDI controller inputs, the Micro will step up to the plate and swat it into the bleachers.

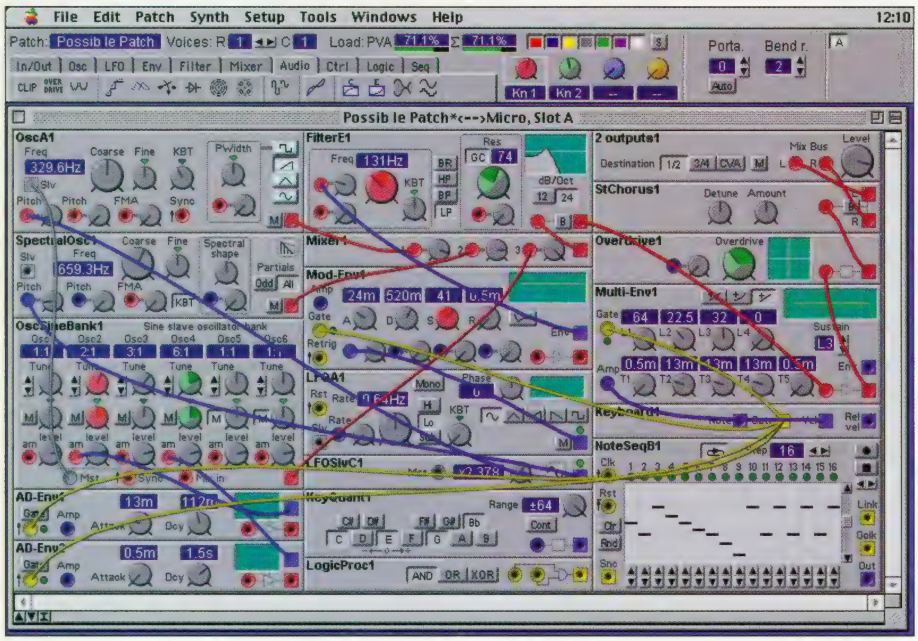
New Modules

Clavia has done a very effective job of adding to the module roster. Version 1.0 was deep, but 3.0 is so deep it's darn near unfathomable. Let's take a closer look.

◆ *Vocoder.* Vocoding is useful not only for robot speech but for adding dynamic inflections to almost any sound. For example, you could run a drum loop into the Micro and use it to add a rhythmic pulse to a bass or pad.

When I used a sampling CD containing spoken phrases as an input, I had no trouble distinguishing the words and sentences coming from the vocoder's speech output. Extending the sonic possibilities considerably, each of the 16 analysis bands can be linked to any filtering band. For example, you could use a hi-hat input as the modulation source, and use it to drive the level of a bass or midrange band.

Because the Micro has two audio inputs, you can choose whether to vocode its own synth sound or whether to process one external audio signal with another. Because vocoding is a DSP-intensive process, you're well advised to park the vocoder in the Common Voice area, so as to still have a few voices of polyphony. If you make the mistake of putting it in the Poly Voice area, you'll be limited to one-voice operation. ➥



Module mania, Nord style: Here we see a few of the new modules in the Nord/Micro Modular lineup, and a few that have been around since version 1.0, all hooked up and ready to play. In the left column are three types of oscillators — the standard Oscillator A, a Spectral Osc, and a Sine Bank. The two AD envelopes at the bottom of the left column have been patched to control the amplitudes of two of the sine waves in the Sine Bank. The gray patch cord running from the OscA "Slv" jack to the Sine Bank "Mst" jack causes the Sine Bank to track the frequency of OscA; without this cord, the Sine Bank would play at fixed pitches.

In the middle column are a classic 24dB/octave filter (presently in lowpass mode), an audio mixer that receives the oscillator outputs and feeds the filter, an ADSR Mod envelope whose attack time is being modulated by the LFO below it, a vibrato LFO whose output is being patched across to the oscillators, and a couple of modules that aren't being used in the patch — a Key Quantizer (presently tuned to a C7 chord) and a Logic Processor.

At the top of the right column is the audio output module. Below it are two effects (a stereo chorus and an overdrive). The amplitude envelope is next; this is a multi-stage rate/level envelope module, and like the other Nord/Micro envelopes it has an internal amplitude processor, so that audio signals can be routed through it, as shown here. Below it is the MIDI keyboard input module, and at the bottom is another module that's not being used in the patch, a 16-step sequencer.

A few of the knobs are red and green. These have been assigned to respond to Morph knobs (the colored knob icons in the upper area). The Morph knobs, in turn, have been assigned to two of the Micro's hardware knobs. Also across the top are the module palette (left), the DSP usage meters (center top), and other controls.

◆ *Drum synth module.* There's nothing new in the way of sonic possibilities in the drum synth module, but it puts all of the components of classic analog beatbox snares, toms, and kicks in one convenient place. You get two sine oscillators with separate tuning, decay, and level controls, plus a pitch envelope amount and decay time for both oscillators. In addition, there's a noise source that's sent through a swept resonant filter with its own decay time and output level control.

I wasn't real impressed with this module. I'd rather do the patching myself, so as to get control over things like oscillator waveform. Also, the noise filter doesn't track the module's pitch input, so you can't play hi-hat sounds up and down the keyboard. I found that patching an overdrive module into the drum synth's output made the sound a lot more colorful.

◆ *Filters.* The Filter Bank module gives you 14 static-frequency bands, making it suitable for precise tonal shaping. By assigning some of the bands to a Morph input, you can crossfade between two related timbres. There's no control over the frequencies of the bands, and individual bands can be controlled in real time only from the Morph input, not from internal envelopes and LFOs.

The Vocal Filter is more versatile and more fun. It lets you set three formant vowels (ah, ee, oo, and so on) at a time, blend among them with one knob or control input, and offset their formant frequencies with another knob. There's also a resonance amount knob. I got some rich and gutty (though not especially realistic) bowed bass sounds out of this filter with the aid of a couple of oscillators and a delay line.

◆ *Oscillators.* The Formant oscillator has a waveform control that lets you choose from among 128 different waves, each of which has a slightly different overtone structure. By sweeping this parameter from an LFO or envelope, you can create stepped modulation that's vaguely reminiscent of sweeping the wavetable on a Waldorf Microwave.

The Spectral oscillator has, in essence, a built-in lowpass filter. The spectral shape knob and control input govern the overall strength of the overtones in the waveform. A button lets you select odd overtones (a square wave) or all overtones (a sawtooth).

The Sine Bank is another streamlined resource, giving you half a dozen individually tunable sine waves with level controls, AM (amplitude modulation) inputs, and individual mute buttons. With a little patience, a few AD (attack-decay) envelope modules patched to the AM inputs, and a distortion module to rough up the sound, I was able to get reasonably close to an additive synthesis steel drum with the Sine Bank.

◆ *Envelopes.* More good news for modulaholics: Clavia has added an ADSR envelope module with a separate modulation input for each of the four segments. This is especially useful in conjunction with the step sequencers, as it gives you control over the articulation of individual steps in your sequence. Also new is a multi-stage envelope with four level settings and five times. Any of the four levels can be set as the sustain level, but the module doesn't allow looping, nor does it have an end trigger output to allow for chaining multiple envelopes together. Like the Micro's other envelopes, these modules include a simple software VCA, so you can use them to shape the level of a signal (either audio or control) without needing to patch in a separate level-control module.

◆ *Miscellaneous.* The NoteVelScale module produces a control signal that can rise or fall on either side of a break point key, much like the keyboard scaling on an old Yamaha DX synth. This is quite useful for getting a filter to track the keyboard without going over the top at one end or the other. ➥

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The Key Quantizer has a set of 12 buttons, one for each note in the chromatic scale. Given an input control signal (a continuous sweep from an LFO, for example), the output will step through the values you've chosen. If the output is sent to the pitch control input of an oscillator and the input is turned up all the way, you'll hear an equal-tempered arpeggio. Since the arpeggio won't sync with anything, this may be of limited utility — but I tried using the module as a shortcut for keeping the output of a step sequencer in a particular key while controlling the steps with some sloppy knob work, and it worked just fine.

The Digitizer module is tailor-made for lo-fi effects. It can reduce the bit resolution and sampling rate of an incoming audio signal — and the effective sampling rate can be swept by a control signal. The obvious application is for processing external audio, but you can also introduce some very interesting aliasing and grunge to the tone of an oscillator.

Wish List Clavia has addressed some of the issues that I raised in my original review of the Nord Modular, but I'd still like to be able to use the LFOs and envelopes as inputs for Morph modulation routings. Up to 25 Morph inputs can be used now, as opposed to the ten allowed by the original software — but there are still only four Morph control busses. I also wish the modulation input amount knobs on the various modules were bipolar: To flip the modulation amount, you have to grab an extra module that contains an inverter. And a longer delay line, even if it required that the user add some RAM, would be very useful in conjunction with the external audio inputs. 2.65ms of delay is fine for creating subtle phase relationships in the tone, but it's not much use for anything else.

While the 3.0 software supports bank loading and saving, it still doesn't have a full librarian implementation. You have to assemble your bank in the instrument's RAM and then offload it to the hard drive. Once saved, it can be reloaded into the instrument with one command, but the contents of the bank can't be rearranged in the computer. Not only that, but every bank upload from the Micro adds a new copy of each patch to your hard drive, which will get messy after a while.

As it happens, the version 3.0 editor software is not compatible with the large library of version 1.1 patches available on Clavia's Web site. I'm told that these patches have been converted to 2.1 files (which are compatible with 3.0) and are also archived on the site in that form, but the download banks are not parallel, so I couldn't verify that everything has been converted — and if your friend happens to want to share some 1.1 patches with you, you're screwed, at least if you're a Mac user, because the 2.1 editor software, which is required to do the conversion, is not available for the Mac. The 3.0 software should have been made backward-compatible with the older files.

Still, these are details. The features of the Micro Modular are so powerful that it would be almost criminal to deprive yourself, or impoverish your music, just because it's not perfect. ■

KEY INFO #121

Senior editor Jim Aikin learned the principles of modular synthesis in 1975 on founding editor Tom Darter's ARP 2600. It was a religious experience.

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Yamaha SW1000XG

PCI AUDIO/MIDI CARD (WIN/MAC)

by Brian Smithers

A dual-platform PCI card that combines a wavetable synthesizer, multi-effects processor, and I/O for digital audio recording.

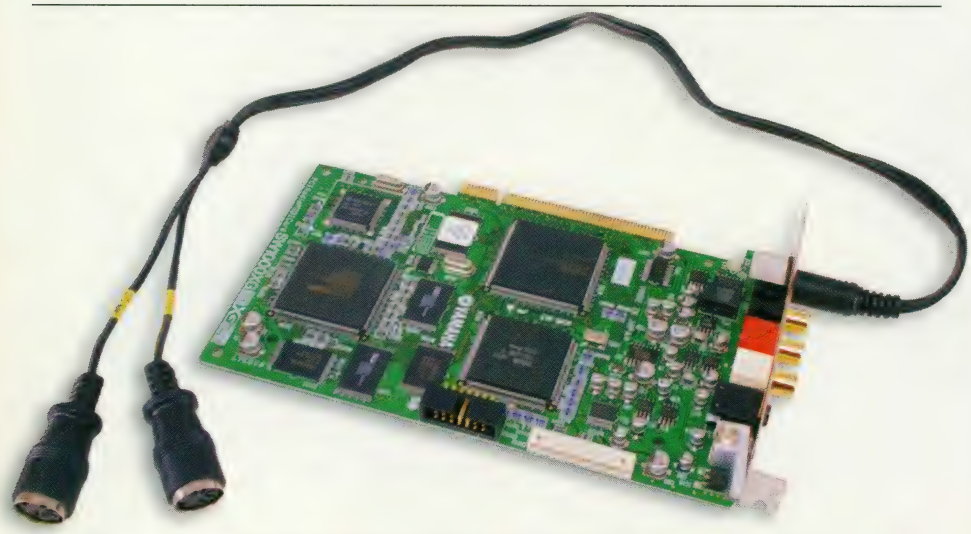
Pros: A viable PCI soundcard (complete with ASIO and OMS compatibility) for the Macintosh. Loads of high-quality, thoroughly editable synth sounds. Wide variety of high-quality effects can be applied to audio as well as MIDI tracks. Easy internal mixdown of audio and MIDI tracks with effects to WAV file. Daughterboard connector allows other types of synthesis to be added.
Cons: Bundled software is not intuitive and lacks support for audio plug-ins. Support for major sequencers requires freeware MIDI utility and purchase of XGEdit shareware editor. Documentation is extensive, but not very accessible. Audio input is on stereo 1/8" jack. No RAM for user synth presets.
Bottom Line: The SW1000XG is a powerful synthesis card with a ton of great sounds, extensive control over the sounds, high-quality effects, and some useful features for basic audio recording – but to take advantage of the power you'll need to configure the software, which may mean doing a bit of head-scratching. The bundled Windows software is enough to get you up and running even if you're starting from square one – and Yamaha has thoughtfully included some templates to let you use the SW1000XG more easily with big-name sequencers. If you need a soundcard that includes a truly exceptional synthesizer, the SW1000XG would be a good choice.

Yamaha, 714-522-9011, www.yamaha.com

$699.99

If I had to go out right now and buy a new soundcard, I honestly don't know what I'd bring home. I do know that Yamaha's SW1000XG would be on my short list of cards to check out. Its plentiful, high-quality synth sounds alone are enough to make it a contender. Add to that the ability to edit the synth patches in minute detail, and you have a big sonic palette at your fingertips. It's great to be able to use the board's hardware-based effects on audio tracks instead of burdening your CPU with more plug-ins. Just to be clear, though, you can still use whatever plug-ins your digital audio software supports to massage some tracks while the SW1000XG is processing others. The SW1000XG's effects, which include such things as amp simulation and rotary-speaker effects, also go a long way toward making the synth sounds come alive. The card is expandable, too, supporting one of five available daughterboards for additional types of synthesis and integrating directly with Yamaha's DS2416 audio card, better known as the DSP Factory (reviewed Mar. '99).

The SW1000XG — let's just call it the SW — installed easily on both a Celeron 333 and a Pentium III 450, and never gave me a moment's trouble on either, but trying to exploit all of its power occasionally gave me headaches.



The SW1000XG is not just a traditional "synth on a chip" soundcard. Its effects can be applied to audio tracks too.

The bundled software puts its features at your fingertips — if you can figure out where to look. If you'd rather use your own digital audio sequencer, you'll be pleased to discover that Yamaha has thoughtfully included mixer maps for Cakewalk, Cubase, and Logic. These are a great idea, but those I tried fell short of making the card's features easy to use. Also included are ASIO, MME, and OMS drivers. We're told that a beta Windows NT version is currently downloadable.

The XGworks sequencer/recorder software (see below) is Windows-only, so Mac users will have to supply their own. They'll also have to download XGEdit (see below), which is cross-platform. The supplied Cubase and Logic mixer maps will load into the Mac versions of these programs. Owners of Mark of the Unicorn Digital Performer, Opcode Vision, and other sequencers will have to cobble together their own controller setups for operating the SW. [*Ed. Note: The SW1000XG installed quickly and easily on our Mac, and we were able to send both MIDI and audio through it without trouble. The documentation for the included Mixer Maps, however, is utterly baffling. By poking and prodding, we were able to figure out how to add SW reverb to a Steinberg Cubase audio track, but when it comes to the finer points of getting the two products to work together, you're on your own.*]

The SW's synthesis capabilities are equal to those of the Yamaha MU100 module (reviewed Mar. '98), with 64-note polyphony, 32-part multitimbrality, 1,267 normal voices (the Yamaha term for synth patches), 46 drum voices, and 20MB of wavetable ROM. The card features six 24-bit effects blocks, which can be applied either to synthesizer parts or audio parts. The I/O includes MIDI in and out, stereo analog input on an 1/8" minijack, stereo analog output on a pair of RCA jacks, and a stereo S/PDIF coaxial digital output. The bundled software includes XGworks version 2, a Windows-only digital audio sequencer with XG Editor built in for editing patches and controlling effects, and TWE for editing digital audio tracks.

Sounds

The most exciting thing about the SW1000XG is its synthesis engine. Its 20MB of wavetable ROM serves as the foundation for a broad selection of useful sounds. Under the category of "Pianos" alone, there are 116 variations. These include the usual suspects: grand pianos, electric pianos, harpsichords, and Clavinets of every variety, as well as a number of piano sounds based on

Yamaha's classic DX series synths. There are bright versions, warm versions, and resonant, detuned, and chorus versions, so many that you'll likely wear yourself out deciding which sounds you like best.

The drum and percussion sounds are solid and cover a range of styles. The XG drum map scores points for including a snare drum roll, rim shot, and brush techniques; little things like this can make a big difference in programming convincing drum parts. Likewise, the inclusion of a brass patch with a fall-off and another with a *sforzando* attack makes for better horn parts. There are a number of worthy woodwind sounds, but I was less impressed with the solo trumpets and some of the solo strings.

As for guitars, basses, and synth leads, there are about as many sounds in each of these categories as in the piano category. They cover a wide range, with most of the classic sounds represented. Pads, effects, ethnic sounds, and organs round out the collection. No synthesizer does everything, but the SW covers a major chunk of the contemporary musical landscape in pretty fine fashion.

As you might expect, many of the sounds use two elements — the Yamaha term for an oscillator/filter/envelope object — so you won't always have 64-note polyphony. It would take a week to get an accurate count, but looking through the SW1000XG's voice list I'd estimate that almost half of its sounds are two-element sounds. This means that available polyphony will typically be reduced from 64 voices to between 40 and 50, with a minimum of 32. If you find yourself favoring two-element voices, you'll want to set the voice reserve parameter so as to avoid voice-stealing.

If the onboard sounds aren't enough to get your ears excited, doubtless you'll appreciate the connector for adding one of Yamaha's five PLG-series expansion daughterboards. These boards (discussed in more detail in the S80 review on page 98) also add to the total polyphony count. The PLG150-VL is based on the VL70M physical modeling synthesizer, and the PLG150-DX features six-operator FM synthesis for putting a DX7 clone in your computer. The PLG100-VH has a three-part vocal harmonizing processor. The PLG150-AN is derived from the AN1x analog modeling synthesizer, and the PLG150-PF provides 16MB of acoustic and electric pianos. The older PLG-100 series boards didn't have any user RAM for storing patches, but the new 150-series boards do. The 150 series also requires a "P" revision of the SW1000XG. If you buy a PLG150 card and your SW doesn't have this revision installed at the factory, Yamaha will upgrade it for free; all you have to do is take it to an authorized service center.

Vital Stats

System requirements	free PCI slot; PC: 133MHz Pentium, 32MB RAM, Win95/98; Mac: Power PC 604/150, 32MB RAM, 512k L2 cache fitted, System 7.61 or higher
Sampling rate	44.1kHz record; 48/44.1/22.05/11kHz playback
Bit resolution	20-bit ADC; 18-bit DAC; 24-bit internal processing, sends 24-bit to compatible software
Analog I/O	stereo 1/8" jack in, dual RCA out (full-duplex recording)
Digital I/O	S/PDIF coaxial out, 16-bit
Word clock sync	none
MIDI I/O	6-pin jack for supplied MIDI in and out cable connector
Synth features	32-part multitimbral, AWM2 sample playback synthesis, 64-note polyphony, 20MB waveform ROM; 1,267 sound programs (incl. 614 in TG300B mode for compatibility), 46 drum kits, 6 effects busses
XGworks features	2 mono or 1 stereo track record, 12 mono or 6 stereo track playback; 480 ppq MIDI clock resolution, quantize (strength, sensitivity, swing, velocity, gate), thin controllers, transpose, markers, auto-accompaniment, notation with lyrics, piano-roll, graphic controller editing, drum view, event edit, multi-stage undo
Effects types	reverb (12 types), chorus (14), variation (70), insert (43), 5-band EQ (4)
Options	PLG150-VL, $199.95; PLG150-DX, $349.95; PLG100-VH, $169.95; PLG150-AN, $299.95; PLG150-PF, $349.95; XGEdit, £25

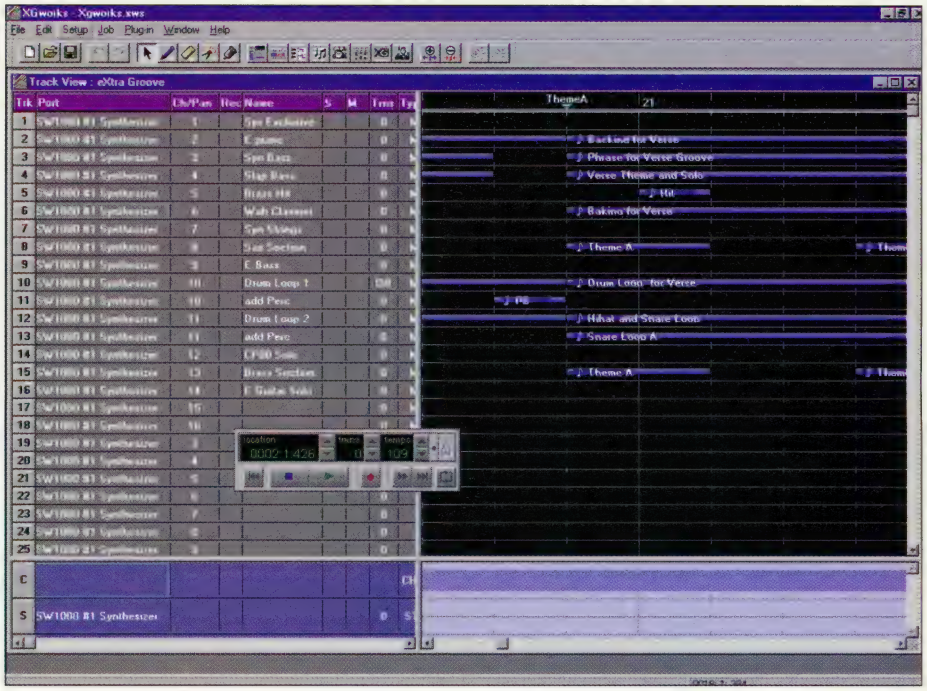


Fig. 1. XGworks' Track View provides most of the standard information we've come to expect in a sequencer's track layout, but it doesn't list patch names anywhere. The bottom section contains chord and style tracks for auto-accompaniment.

Effects The multi-effects processor built into the SW1000XG plays a significant role in making you forget any stigma you may have attached to the term "soundcard." It's a serious tool, with flexible routing, decent presets, and fully editable parameters (see Figure 3, page 116). It features two stereo-output "system effects," namely reverb and chorus, which function as if they were on auxiliary buses. The effect type, parameters, and return level for the system effects are set globally, and the send level from each MIDI or audio part is set by General MIDI controllers.

The two stereo-output "insertion effects" function like channel inserts on a mixing console. They are therefore applied to only one

part. This is where you would apply effects that make a part stand out from the mix, such as adding distortion to a guitar or rotary speaker to an organ. The insertion effects also include reverbs and choruses, along with overdrive, auto-pan, tremolo, and more.

Two additional effects blocks are available. One is the Variation effect, which can function as an insertion effect or as a system effect, depending on your needs. The other is a global five-band EQ.

Each effect has a window in which you can adjust the parameters. Most of the algorithms, when used as an insertion effect, have a parameter that can be controlled by an assignable MIDI controller. In many cases this is the wet/dry mix of the effect. For the rotary speaker, though, the assignable controller varies LFO speed, creating the illusion of the speaker spinning faster or slower.

So the effects are powerful and versatile — but how do they sound? Pretty darn good. You may not find every subtle nuance you ever dreamed of, but what you will find are pleasing, convincing effects that work well together. The reverbs, for example, are smooth and natural, with decay times from 0.3 to 30 seconds, low- and highpass filters, and control over diffusion and density.

My favorites, though, are the special-purpose effects such as the amp simulator. Guitar sounds vary so widely that it's unreasonable to expect a synth module or soundcard to have all the timbres you could ever want. With the SW's insertion effects, you can take a "clean" guitar patch, run it through the amp simulator, and shape the sound any way you want. Add distortion and overdrive to the lineup, and suddenly those sequenced tracks spring to life. The rotary speaker and wah-wah effects are similarly effective.

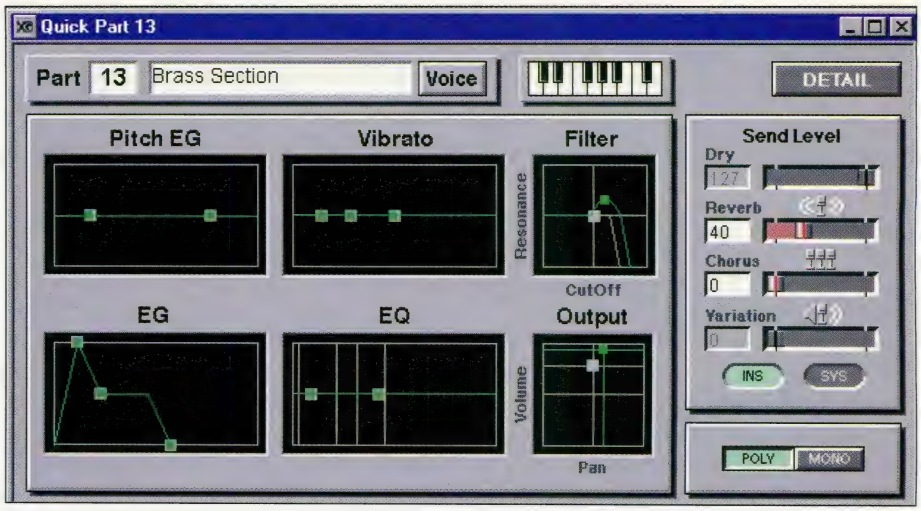


Fig. 2. The XG Editor's Quick Edit window gives you graphical control over important synthesis parameters, from envelope generators for both amplitude and pitch to filter cutoff and resonance. The Detail button opens a comprehensive text-based parameter editing window.

Audio

Externally, the SW1000XG is a stereo-input, stereo-output card. Internally, XGworks gives you six additional stereo output busses, which are routed to the SW's effects, and one additional pair of inputs, which can be used for recording the audio coming from the card's synth voices and effects. This gives you great flexibility: Each output bus can be used for processing already recorded tracks through the card's hardware effects.

For example, you could use the SW's distortion on an audio track of clean guitar. Simply route the audio track by itself to one of the six output pairs, then assign an insertion effect to that output pair and set it to distortion. By assigning software plug-ins to your sequencer's virtual aux busses and then routing the aux busses to the various output busses on the SW, you can create a huge variety of effect combinations.

Another nice touch is the ability to use effects on the audio inputs so that the performer hears the effects while only the dry audio is recorded. This is the default behavior when you select "SW1000 #1 WAVE IN" as your recording source. Because the audio is passing through a hardware processor rather than the CPU, the performer won't get confused by timing latency.

The additional "input" bus is one of the coolest things about this card. By selecting "SW1000 #2 WAVE IN" as your recording source you can record your entire SW production to a stereo audio file. It combines all recorded audio tracks, all incoming live audio, all internal synthesizer parts, and all effects as you've applied them to both synth and audio parts. In other words, when you like what you hear coming out of your speakers, you can capture it to disk in a single step. Even if you're using external synths you can run them through the SW's line input and mix everything down at once. You might still wish to record your internal and external MIDI tracks to an audio submix first to free up effects, but it's not necessary.

As the centerpiece of a modest hard-disk recording setup, the SW does a good job. It supports 16-bit stereo audio at up to a 44.1kHz sampling rate, and sports 20-bit ADCs and 18-bit DACs. The product literature states that the SW will also support mono recording and playback in 32-bit mode, but I'm not aware of any audio software that would support this. According to Yamaha, if your audio software supports 24-bit recording and playback, the SW will be able to send and receive 24-bit audio to and from the software, though the S/PDIF digital output will only transmit 16-bit sound. The sound is fine, and the digital output is a nice touch, but I wish the analog audio used RCA inputs instead of a stereo minijack. I suspect many users would gladly trade the S/PDIF connection for a more convenient type of analog inputs.

Software

The Windows software bundle consists of three interrelated programs: XGworks 2.0, XG Editor, and TWE (Tiny Wave Editor). They work well together, and they address all of the SW1000XG's special talents, but they were the source of most of my headaches.

XGworks offers the basic functionality we've come to expect from digital audio sequencers, with the notable exception of audio plug-in support. You can view your MIDI tracks in the standard piano roll, staff notation, event list, or track view (see Figure 1, page 113). There's even a very cool Drum View that features graphical editing of drum parts. You can perform a variety of operations on MIDI data, from quantization (including swing quantization) and transposition to data thinning. You can print quick-and-dirty parts from Staff View, but aside from the ability to include chord changes and bar numbers, the layout options don't compare to even the most inexpensive notation programs.

Under the Plug-In menu heading is the SW1000XG mixer, which allows you to automate

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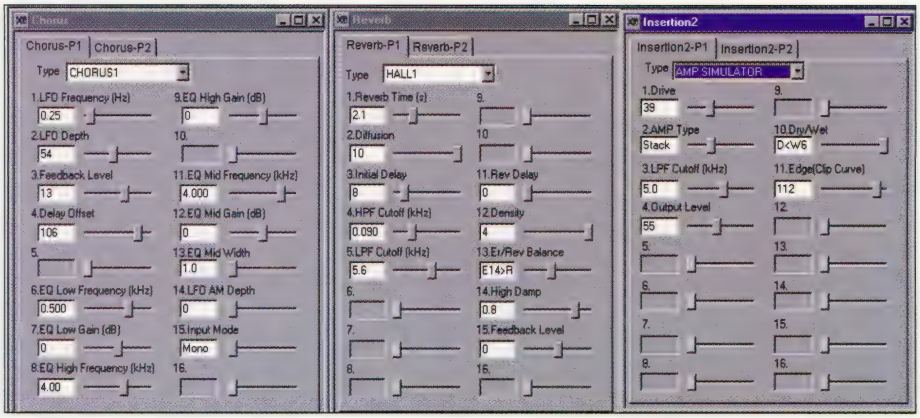

Fig. 3. When you press the Detail button on an effect in the XG editor, a window like one of these appears, with sliders for adjusting the available parameters.

a mix by inserting mixer snapshots and recording realtime fader movements for the 12 audio output busses as well as the two audio inputs. Parameters that can be automated from this window include level, pan, and mute, along with variation effect, chorus, and reverb send levels. XGworks doesn't provide for graphic envelope mixing — TWE is where you'd perform precise fades and other surgical procedures.

Significantly, automating level changes in your audio mix is done at the bus level, not the track level. For example, you can easily route several audio tracks to the same output bus, but if you do so, you'll have no way to adjust their relative volume levels. For maximum flexibility in mixing, it's best to think of XGworks as having a track count of six stereo or 12 mono audio tracks, even though you can add more tracks if your CPU and hard drive are fast enough.

At the bottom of the Track View is the Style/Chord Track. I was skeptical at first about the value of auto-accompaniment in a digital audio sequencer, but to my surprise the accompaniments are stylish enough to be very useful. You can enter a chord progression in the chord track and then choose the style in which the accompaniment is to be generated in the style track. A great many styles are included, from country and disco to R&B. Each style is subdivided into variations such as Intro, Main A/B, Ending, and Fills. For roughing out a new tune in a hurry, the styles are great. If you like what you hear you can expand it to MIDI tracks for tweaking.

I found it annoying that XGworks' track window doesn't show you what patches you've selected. You have to open the XG Editor to see the list of sounds assigned to the 32 SW parts. XG Editor opens from within XGworks and gives you control over every aspect of the SW1000XG, from envelope generator to effects parameters. Its main screen lists the current voice names. You can save your entire 32-part setup, including all of your voice edits, into the current song's "setup bar," but there's no way to save off individual edited sounds so as to load them into other songs.

XG Editor lets you select voices, route and control effects, control volume, pan, and effects sends of all audio and MIDI parts, control master equalization, and edit drum setups. By selecting a voice and clicking the Detail button at the bottom of the voice window, you open the voice Quick Edit window (see Figure 2, page 114). This simple but powerful window gives you control over the voice's envelopes, EQ, vibrato, and more. Clicking on this screen's Detail button opens a text window with still more parameters to adjust. Parameter edits can be recorded while the music plays, so you can create filter sweeps and such from within XG Editor.

TWE is where you edit audio blocks recorded in XGworks. It provides basic cut-and-paste functions along with fade in/out, reverse, invert, gain change, and normalize. It also does pitch-shifting and time compression/expansion, and has a truly nifty and intuitive three-band parametric equalizer. You might hope that since XGworks doesn't support audio plug-ins, TWE would provide at least some basic offline effects processing, but there's no chorus, reverb, or compression to be found.

XGworks and TWE are fine for basic sequencing and recording, but the lack of support for software plug-ins will limit them for some users. Many other users will have time and money already invested in one of the major digital audio sequencers. Fortunately, Yamaha has included support files for Cakewalk,

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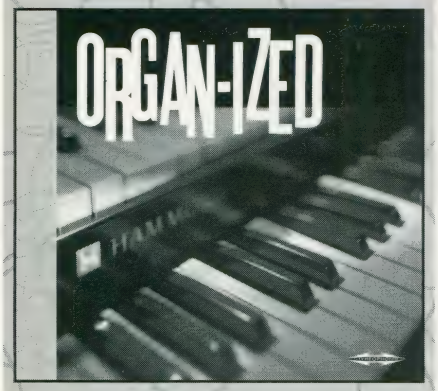

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KEY INFO #215

Cubase, and Emagic Logic in the form of instrument definition files and mixer maps. I tried several Cakewalk Studioware panels, each of which covers a different aspect of the SW's operation — audio mixing, patch editing, and more. They're powerful and useful, but they suffer greatly from lack of documentation.

A far better way to exploit the power of the SW in your favorite sequencer is to run a shareware program called XGEdit concurrently with your sequencer program. (You can't do this with XG Editor, because it's built into XGworks.) XGEdit lets you control all aspects of the SW in real time and record your edits into your sequencer as sys-ex data. You can change reverb decay time, detune and then retune a part, or change the drive level of an amp simulator, all on the fly. The registration fee for XGEdit (www.yamah.co.uk/shop/home.asp) is £25, or approximately $40. Consider it a necessary accessory if your platform of choice is a Macintosh, or if you want to stick with your current Windows sequencer.

Using XGEdit with a Windows sequencer program requires a separate multi-client MIDI driver such as "Hubi's LoopBack device," a freeware program from Austrian programmer Hubert Winkler. Such a driver allows your sequencer and XGEdit to share the SW1000XG, and allows control changes made in XGEdit to be recorded into your sequencer. According to Yamaha, in a Macintosh music system XGEdit and your sequencer can both talk to the SW's MIDI ports at the same time using OMS.

If all this seems unnecessarily complicated to you, you're not alone. The latest version of the SW1000XG drivers adds some multi-client capabilities, however. You can now run XGEdit and your favorite sequencer at the same time, but to record system-exclusive data from XGEdit into your Windows sequencer you'll still need help from Hubi.

Yamaha deserves credit for including *a lot* of documentation. There are four different .PDF files and a printed manual, for a total of 472 pages. There are even more helpful files on the SW1000XG website (www.xgfactory.com), including Hubi's LoopBack, XGEdit, and an extensive FAQ file. Unfortunately, much of the documentation is way too technical. If ever a product cried out for a straightforward tutorial, this is it. ■

KEY INFO # 122

Brian Smithers is a musician and conductor at Walt Disney World. His website, http://members.aol.com/notebooks1, covers making music with a notebook computer.

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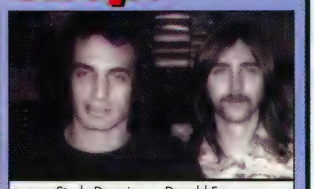
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KEY INFO #80

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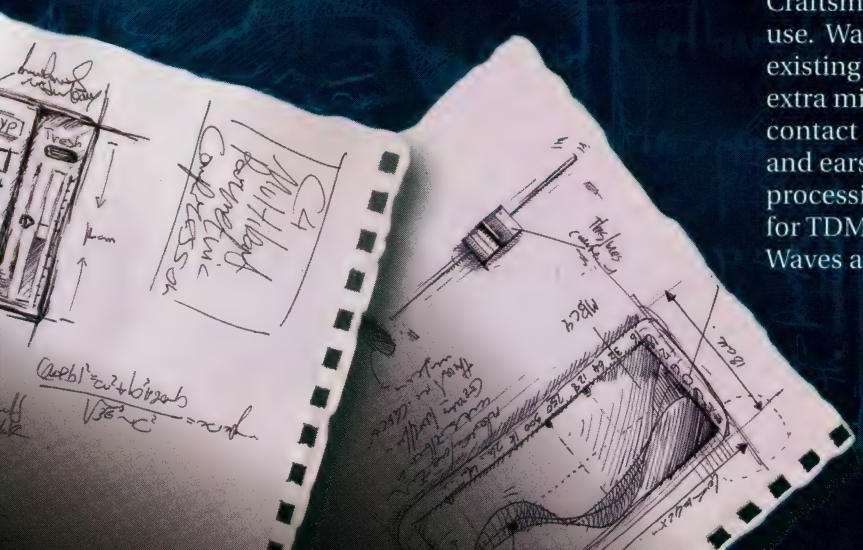


WAVES

KEY INFO #62

USA: 1-423-689-5395 ■ Rest of the World : 972-3-5107667

w w w . w a v e s . c o m

Roland SRV-3030

24-BIT DIGITAL REVERB

by Jim Bordner

Rackmount digital reverb unit.

Pros: Dense, full-range, and realistic reverbs. Dynamic Separation feature allows for unique programming possibilities. SmartMedia card slot for expansion or backing up your own patches. Slick patch-browsing features.

Cons: No dedicated front panel controls for in, out, or mix. Interface takes some getting used to. Factory programming makes initial studio setup difficult.

Bottom Line: If you're craving a nice-for-the-price reverb, the SRV-3030D fills the bill. It sounds great, and I found its tonal color different enough from the reverbs in my rack to make it a welcome addition to several mixes I worked on during this review. Give this 24-bit beauty a Key Buy.

Roland, 323-685-5141, www.rolandus.com

SRV-3030 (analog I/O only): $695; SRV-3030D (adds digital I/O): $995

As a leader in music technology, Roland has a reputation for innovation. Continuing that tradition are their latest SRV digital reverbs, the SRV-3030 and SRV-3030D (the D model has the same look, feel, and features of the 3030, but adds digital I/O). There are plenty of quality digital reverbs for less than $1,000, but both SRVs have impressive feature sets that include some slick browsing features and the ability to design reverb patches that change their output based on the nature of the input.

I used the SRV-3030D for this review, and here's what I discovered in the process.

Out of the Box

The SRV-3030D makes a fine first impression even before its plugged in. The LCD is larger than you'd expect on a reverb unit, and the gun-barrel blue finish gives it a distinctive look. The front panel power switch is a welcome feature, as is the internal power supply, although I would wish for a detachable power cord; this one is hard-wired.

Thumbs up for the 3030D's user's manual. I own a few Roland synthesizers, and have found them to be excellent-sounding and workable tools, but reading their owners' manuals is often a frustrating experience. The manual for the SRV-3030D is a real improvement: It's clear and straightforward, it gives new users a decent tutorial, and it gives power users the information they need to get down in the belly of the beast. It could still be better in terms of organization and clarity, but I only found one major documentation problem that related to the setup phase.

Setup

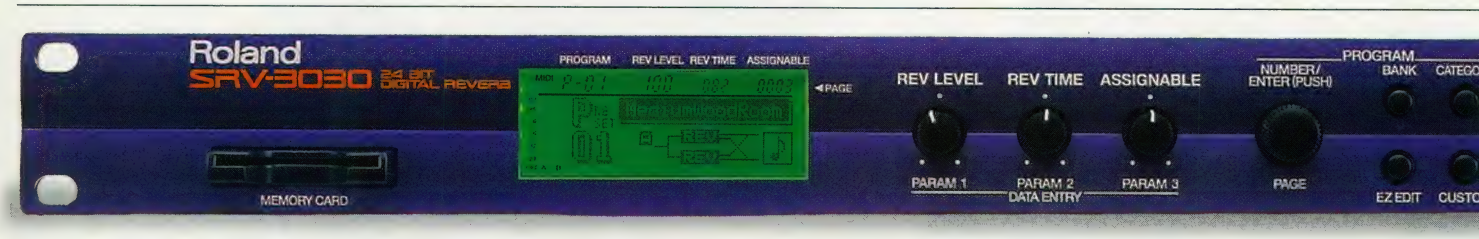
The SRV-3030D has a pretty standard set of back panel connectors — two sets of stereo analog ins and outs, S/PDIF in and out, MIDI in and out/thru, and jacks for a footswitch (which can be used to turn the unit's bypass on and off) and an expression pedal. Ins and outs are variable between –20 and +4 operation, and the levels of the digital I/O can be adjusted as well.

The SRV-3030D has no dedicated front panel knobs for input, output, or mix balance. So initial setup is either a breeze or a minor hassle, depending on how you're going to use the unit. The factory presets seem to be biased toward a live performance setting — that is, wiring the unit directly between an instrument or two and an amplifier or stage mixer. For example, the Mix Blend controls default to a setting between 40% and 60% (the numbers expressing a percentage of wet signal to mixed dry signal). For use in a mixer's effects loop, where you want the Mix Blend set to 100%, you have to go through the patches, set them each to 100% wet, and then save them.

The SRV-3030D has one more surprise for studio users: I assumed that setting the Mix Blend control for each patch to 100% would eliminate the dry signal, but it doesn't. There is a system-wide setting called Dry Signal Out, mentioned in a one-sentence note in the setup pages of the manual (which I initially missed), and another sentence in the back of the book (which I found only after stumbling across the setting in the unit itself). A call to Roland confirmed my suspicion: Unless this is set to Off, the dry signal is still present in the output. This explained why the unit sounded tinny and "phase-y" to my ear during my first day with it; I was using it as a send-and-return device, and was therefore introducing a very slightly delayed version of the dry signal back into the mix. Once I found Dry Signal Off, it worked exactly as expected. I would suggest to Roland that they make stronger mention of this feature in the manual. Better yet, since all the controls are in software, it would be nice if Roland created two (or more) sets of factory defaults: One for live users and a second set for studio users that would automatically set all mix blends to 100% and activate "Dry Signal Off." It would save a lot of time getting to know the box and make the initial experience much more pleasant.

Operation

The SRV-3030D is relatively easy to operate, but you *will* need to read the manual. Patch selection is made by twisting a knob and then pressing the knob to activate the patch once you've got it dialed in. After you press, it takes a second for the effect to load and become audible. The three small Parameter Change knobs on the front panel are "soft" knobs that allow you to access a variety of parameters, but each defaults to a commonly used parameter, so you can make



Millennium verb . . . Roland's SRV-3030 is 24-bit equipped and smooth as silk.

changes without paging through menus. The Param 1 knob is preset for controlling reverb level, Param 2 is for length (decay time), and Param 3 controls a parameter that varies from patch to patch that Roland generically calls Character. For example, on the "Closed Room" patch, knob 3 is mapped to the Pan Width parameter; on other factory patches or on your own programs, it may be mapped to any of the SRV-3030D's long list of control parameters. You can check (or change) which parameter is mapped to any of the three control knobs by digging a couple pages down into the Custom edit screens, or you can simply twist the knob and listen to what happens. You can also assign MIDI controller numbers to parameters and change them in real time by MIDI remote or from a sequencer, or by using a MIDI footpedal. Roland offers their own EV-5 or FV-300L expression pedals (sold seperately). The resolution of these controls are very good, by the way; I couldn't detect zippering or artifacting while changing parameters in real time.

The 3030D has 200 preset locations in two banks of 100. The 100 factory programs in the Factory bank are duplicated in the User bank, which makes editing and saving your own versions of the factory programs pretty simple. Roland has included a couple of nifty browsing features. For example, it groups the presets by category: vocal settings, percussion settings, and so on. Each preset's category is identified by a small icon on the LCD (a drum, a microphone, a keyboard) so they're easy to find when browsing through a bank. Or you can choose to browse by category, so only presets from the Vocal category, for example, will show when you turn the selection knob. You can select in which of the categories your own patches will appear with a simple twist of a knob in the unit's Patch Naming page. Imagine you have 200 presets to manage (and hundreds more stored on SmartMedia cards), and you'll see the value of this feature.

The 3030D allows you to audition patches with no input source — it stores a set of samples, one for each category, and plays them back through the effect. The factory samples can be changed by the user, and a good thing, too: The hipster dude who says "check, check, check" for the Vocal previews can get on your nerves. I always audition reverbs while listening to the signal I intend to process, so this feature was less useful to me, but you may find it handy.

Because the 3030D has a sparse front panel, the process of editing patches can be less than intuitive. If you truly hate paging through menus and reading the positions of virtual sliders, you may find yourself sticking to the

KEY INFO #93

The rear panel of an SRV-3030; the SRV-3030D model adds S/PDIF I/O (note the expansion area between the footswitch jack and audio I/O).

presets and simply adjusting level and decay times. But if you want to take the time to learn its secrets, the 3030D provides control over a large range of parameters.

Special Features

The SRV-3030D uses two separate reverb processors, which can be combined or used independently, giving the user four different ways to route the signal. Routing of inputs and panning of outputs is user-programmable. Both of the twin processors produce a stereo output (from either a mono or a mixed stereo input). You can "wire" the processors in series (with inputs A and B mixed and the processors applied one after the other); as individual stereo reverbs (with input A effected only by processor A and input B by processor B), as a single stereo reverb (with processors A and B applying the same reverb to inputs A and B independently); and in Dynamic Dual (where inputs A and B are mixed, and routed to one or the other of the processors depending on the nature of the input).

To do the latter, Roland developed an algorithm they call Dynamic Separation, which allows the unit to recognize certain qualities about the incoming signal, and then decide based on those qualities whether to send the signal through processor A or B. You can then set the two processors to different patches, and let the reverb change its character based on the signal input.

The Dynamic Separator can be set to one of four recognition algorithms: Attack (which divides the signal according to the sharpness of attack), Loudness (amplitude is sensed), Note Density (which divides signals according to density), and Drum (a frequency analyzer of sorts that separates kick drum from other percussion sounds). The threshold of each algorithm is adjustable by the user, so it's possible to design a reverb that gets bigger or smaller when a guitarist picks harder, for example, or one that blooms as a saxophone sample gets louder. You could run a drum loop through the 3030D and apply reverb to everything but the kick drum, or create a patch that applies light reverb to a lead vocal, but turns into a larger effect when the background harmonies join in. I tried it out in my studio, and found that it works, although on some presets the effect is pretty subtle. In live situations or in a smaller studio where every piece has to work harder, this feature could be worth the price of admission. I found myself wishing the Dynamic Separator would sense notes-per-second in addition to note density. It would be big fun to solo through a reverb that gets bigger when you play slow passages and backs off when you play faster lines.

There's plenty of depth in the Custom controls, so if you're a tweaky kind of person, you'll enjoy programming your own reverbs. In addition to the usual parameters, like pre- and post-delay, there are controls for Room Size and Wall Hardness, digital compression on the effected signal, independent EQ controls for each processor, and the RSS stereo spatializing effect found on the Roland SRV-330 Dimensional Space reverb unit. When you max out the 100 user preset locations, you can save them to SmartMedia cards (around $40 apiece from Roland, maybe less elsewhere; see Vital Stats chart for more info). Or you can save and retrieve patches by doing a MIDI bulk dump or load. You don't have to be a programmer to dig the 3030D, though: the presets sound very good right out of the box.

Vital Stats

Converters	24-bit A/D (64 times oversampling), 24-bit D/A (128 times oversampling)
Internal processing	30-bit
Sampling rate	3030: 44.1kHz; 3030D: 44.1kHz, 48kHz
Audio I/O	stereo 1/4" TRS balanced (will accept unbalanced input and output), stereo XLR balanced, S/PDIF digital (model 3030D only)
MIDI I/O	in, out/thru
# of presets/user	100/100
Accessory jacks	footswitch, pedal (not included)
Expansion port	up to 1,000 programs can be saved on non-proprietary SmartMedia FlashROM cards (SSFDCs from 2 to 32MB)
Nominal level	variable from –20 to +4
Power supply	internal
Reported THD	0.01% (dry signal through), 0.02% (effect)
Dimensions/weight	1U rackmount; 6 lbs. 3 oz.

Sound Quality

The big question is, "How does it sound?" In a word: terrific. Even though I had the 3030D (which allows for S/PDIF in and out), I decided to hook the unit up to my Yamaha 02/R using the unbalanced 1/4" analog I/O, just to see how the converters sounded in an analog scenario. A/D converters have improved radically in the past few years, and the 3030D's are no exception. They're smooth and grainless, and exhibit good headroom as well; I could drive the analog inputs very hard without causing distortion.

The reverb programs themselves are also excellent. My faves are the plate-style patches: smooth and meaty, with a dense, substantial quality that I really liked on acoustic guitar, vocals (especially solo and small *a cappella* group vocals), and woodwinds (a very lush sound for tenor sax). Room-type reverbs are realistic and clean, with little or no metallic edginess. Many of the factory programs are optimized for keyboards, and sound great with electric pianos, synth patches, and organ simulation (the "Great Organs" preset sounded excellent on both clean Hammond solos and Jon Lord "Highway Star"-style chords). Presets from the percussion category worked well, too; there's an assortment of drum rooms, some snare gates (including a decent Phil Collins-esque patch), and some dance music offerings with just enough tin-can aftertaste in the reverb tails to give them street cred. ■

KEY INFO #123

Jim Bordner is chief composer and producer at Gravity Music in Fort Wayne, Indiana, where they create music for advertising and film. Jim finally removed the sign over the door that read, "Too much reverb is just about enough."

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Akai Headrush E1

Pros: Lengthy delay times. Tape echo and looped playback modes. Multiple output taps in tape-echo mode.
Cons: No input level indicator, patch memory, delay sync, or time modulation.
Bottom Line: A cool digital stompbox with creative delay possibilities.

Akai, 800-433-5627 or 817-831-9203; www.akai.com/akaipro

$259

Akai's Headrush E1 may appeal to adventurous keyboard players in search of creative delay effects. It features a tape-delay simulation, tap-tempo control, looped playback with overdubbing, and 16-bit/44.1kHz sampling.

A plentiful 23.8-second maximum delay is provided in normal and loop modes, or 11.9 seconds for tape and overdub modes. Delay time is input via taps on the Tap Tempo footswitch, and can then be adjusted using the Coarse and Fine knobs. On the downside, there's no delay sync, time modulation, or patch memory — buy hey, it *is* a stompbox. The Level knob adjusts the effects level, not the input level, and there's no visual indication of input level.

Headrush sports only one input but five outputs (all 1/4" unbalanced). If the Mix output is the only one you connect, it carries the wet/dry mix regardless of the delay mode. Connect the Mix and Effect outputs and the mode determines how signals are routed: In normal and loop modes, only the dry signal comes out of the Mix output and delays come out of the Effect output; in tape mode, delays will bounce between the two outputs. Tape mode also accesses the three additional "Head" outputs, a reference to multiple playback heads on a tape-delay machine. If you have a multi-channel sound system, you can connect the Head outs to get independent echoes coming from different locations, which is extremely cool.

The Head Gap knob varies the "positions" of the four virtual heads in pairs for different rhythmic repeats — such as, bop, bop . . . bop bop, instead of bop, bop, bop bop. The Ratio knob adjusts the echo levels from head to head, so they all sound at an equal volume or taper off at a selected rate. Increasing the high-frequency damping can make Headrush sound more like an old analog delay.

In loop mode, Headrush will capture and repeat the first thing you play, on top of which you can overdub multiple layers — memory permitting.

I had fun with Headrush. Its loop-playback capability allows creative overdubbing experimentation, and the tape-echo mode in combination with a quad or surround speaker setup is to die for. MARK VAIL

KEY INFO #124

Antares ATR-1 Auto-Tune

Pros: Effective pitch correction. Minimal signal coloration. Support for custom scales and MIDI control.
Cons: Doesn't handle bass-range instruments well.
Bottom Line: If you need a hardware-based pitch-correction solution, give the ATR-1 a good look. The combination of a simple user interface and transparent sonics makes it a winner.

Antares Audio Technology, 888-332-2636, www.antarestech.com

$849

Many musicians struggle with intonation, especially in the recording world, where every out-of-tune note is faithfully preserved. To address this difficulty, Antares introduced their Auto-Tune plug-in (reviewed July '97). On the heels of its success comes a hardware version, the ATR-1. Like its predecessor, the ATR-1 is designed to correct the tuning of a performance, whether live or in the studio.

The ATR-1 is a 1U rackmount. Audio I/O is at line level (–10 or +4dB) via balanced 1/4" TRS or XLR input and, strangely, unbalanced 1/4" TS or balanced XLR output connectors. The ATR-1 also sports MIDI and footswitch inputs. The ATR-1 works similarly to a compressor or an EQ: Feed it a monophonic signal (it can't deal with chords), and it transparently tunes incoming notes to the nearest correct pitch.

The ATR-1 is quite capable: You can specify that the input signal be corrected chromatically, to one of 50 programmable scales, or to notes played from a MIDI controller. Only 12-notes-per-octave equal-tempered scales are allowed. You can detune the input from A-440, add vibrato (from an LFO), and arrange programs (each of which holds a scale and other parameters) into songs. A footswitch or MIDI can be used to step through the programs in a song, allowing for key changes.

I used the ATR-1 in several sessions, first on a fretless bass track, then on flugelhorn and E-Bowed acoustic guitar tracks. Fretless bass is one of the hardest instruments to pitch-correct, and predictably the ATR-1 struggled. But by playing with the Speed parameter (which determines how fast pitch correction is applied) I was able to fix some of the problem notes. On the flugelhorn and acoustic guitar, the ATR-1 worked like a charm.

Next, *Guitar Player* editor-in-chief Michael Molenda put the ATR-1 to work at his Tiki Town studios. On a Hofner "Beatle" bass (a notoriously out-of-tune instrument) the results were similar to what I experienced with the fretless. On a singer with extremely poor pitch and a habit of sliding up to notes, the ATR-1 had problems. But on singers with better articulation and attack, it did an excellent job of pitch correction — vocal range material is where the ATR-1 excels. Signal coloration from the unit was minimal.

If your processing needs include intonation correction, definitely check out the ATR-1. It's easy to use, and does a great job of correcting most vocal and vocal-range instrument tuning problems. MITCH GALLAGHER with MICHAEL MOLENDA

KEY INFO #125

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Adaptec Easy CD Creator 4 Deluxe

Pros: Simple and fast creation of both audio and data CDs. Includes tools for creating and applying CD labels, and jewel case inserts. Suite of applications will easily cover many user's needs.
Cons: Given its intended application, none worth mentioning.
Bottom Line: A wide-ranging audio and data CD creation/labeling package that offers incredible bang-for-the-buck. If your needs tend toward professional audio CD mastering or if you'll be burning CDs to use as duplication masters, this isn't the package for you. But for just about any other CD-R/-RW application, Easy CD Creator 4 Deluxe rocks!

System Requirements: Windows 95/98/NT, Pentium 166 or faster, 32MB RAM, compatible CD-R or CD-RW drive.

Adaptec, 800-442-7274, http://cdr.adaptec.com

$99; version and competitive upgrades available

Need to burn audio and data CDs? Back up your hard drive to CD-R? Perform basic audio edits? Work with MP3 format files? Copy CDs easily? Create and apply CD labels? Lay out and print CD jewel case inserts? Need to clean up some images for a photo CD?

If any of these CD-related tasks are on your agenda, and you're a Windows user, Adaptec has a product you should check out: Easy CD Creator 4 Deluxe. For just $99 retail, Easy CD Creator 4 Deluxe is a wide-ranging suite of programs that covers just about all areas of CD creation and related tasks.

There's not enough room here to get into all that the package can do, but for music/studio types, the main things are probably audio CD creation, data backups, labeling, occasional CD copying, and so on. Easy CD Creator addresses all of these tasks in a simple, straightforward manner. In fact, if you don't know how to do something, there are handy "wizard" features that will guide you along your way. You'll rarely, if ever, need to crack the manual or help file, but when you do, things are explained well, and in an application-oriented way,

For $99, you wouldn't expect to get a full-on professional tool in any one of the areas that CD Creator addresses, let alone in all of those supported here. But for that price, CD Creator gives you plenty of power to do the job — you just won't have quite as many options as you would with a dedicated tool. As an example, the CD label creation part of the suite is no substitute for Adobe Pagemaker or Quark XPress. However, it is fast, easy, and it gets the job done with great results.

One word of warning: If you're expecting CD Creator to allow you to do professional-level CD pre-mastering, you'll be disappointed. There's no support for editing PQ points and so on. But the basics are there: track order, spacing, and fades. Most users will find it's just fine for their demo and personal CD creation needs. MITCH GALLAGHER

KEY INFO #126

TC Electronic M3000

Pros: Top-notch reverbs – clean, clear, and lush. Dual effects engines with sophisticated routing options. Excellent user interface. Comprehensive digital and analog connectivity.
Cons: Blinking light on the front-panel power switch may drive you crazy.
Bottom Line: The M3000 is a great reverb. Yes, it can do other things, but the reason to buy it is for those lovely 'verbs. If you're after the best and have the bucks to throw at it, check this box out. Highly recommended.

TC Electronic, 805-373-1828, www.tcelectronic.com

$2,495

Whether it's used for a huge dripping-wet wash or a subtle ambience, reverb defines the space your music lives in. It's also one area where you still, to a degree, get what you pay for. Affordable digital hardware reverbs and plug-ins can provide great sounds, but for truly exquisite reverbs, you still have to lay down the bucks.

The M3000 from TC Electronic sits toward the upper middle of the price spectrum. If excellent reverb is what you're after, the M3000 is worth every penny.

The box is feature-laden. Its I/O covers balanced –10/+4dB analog (XLR) and digital on AES (XLR), S/PDIF (coax and optical), and ADAT (lightpipe). The M3000 can even alter the levels of incoming digital signals. MIDI in, out, and thru and a footswitch input are provided, as is a word clock input.

The architecture of the M3000 is similar to the TC M2000 effects processor. (For a full rundown, check out our review in the Oct. '96 issue.) In a nutshell, it offers two effects engines that can be combined in six ways: serial, parallel, dual-mono, and so on. You can switch between the engines based on signal dynamics or morph between them. I happen to like the user interface introduced on the M2000, which is also used for the M3000. You're given a lot of control, but it's all arranged intelligently. One complaint: The front-panel power switch has a red indicator light that flashes continuously when the unit is turned off. It may eventually drive you nuts.

In addition to reverb, the M3000 covers other effects: chorus, delay, de-essing, and so on, all of which are fine. But the main reason to check it out is its glorious reverbs. There are several types of 'verb algorithms, some from the company's high-end M5000 processor, others, such as the VSS (Virtual Space Simulation), completely new. Regardless of where they came from, all of the algorithms are excellent: clean, clear, and lush. In contrast to other boxes, perhaps the best way to describe the M3000 is natural-sounding. Whether you're using a tiny room or a huge hall, the reverb just sounds *right*. You're given a great deal of control over the parameters, too. (You can hide the advanced parameters if you prefer.) I used the M3000 on eight mixes, on tracks ranging from synths to vocals to acoustic guitar to percussion. In every instance it sounded *wonderful*.

If it seems as if I'm raving a bit about the M3000, it's because, well, I am raving! In fact, *Keyboard* has given it a Key Buy award. If you're looking for a top-quality reverb that offers a natural-sounding alternative to other reverb processors, the M3000 is for you. MITCH GALLAGHER

KEY INFO #127

Burn Your Own CDs

Yamaha A-series samplers are the only ones that can be hooked directly to a CD recorder so you can easily create native format CD-ROMs or burn your own audio CDs - complete with DSP processing.

Mo' Better FX

A-series samplers have more effects and more effects blocks. The 96 different effects, on both the A4000 and A5000, is 25 more than the nearest competition. Actually, rivals in the A4000's price range don't even come with effects!

A Universe of Sounds

Both new Yamaha samplers come bundled with 9 CD-ROMs loaded with studio quality sounds. And, since you can never have enough, both have a built-in SCSI interface and compatibility with Akai, E-mu, Roland, AIFF, and .WAV CD-ROMs. No sampler on the market has that kind of total compatibility.

Killer Specs

The A5000 features 126 note polyphony and 6 effects blocks. The A4000 sports 64 note polyphony and 3 effects blocks. Both can be expanded up to 128 MB of RAM and have 16 different filter types, EQs for each sample, MIDI synched LFOS and so many MIDI controls, they equal dedicated keyboard synths.

The New Yamaha A-Series vs. Akai®, E-mu® and Roland®. The Real Winner In This Competition Is You.

Competition is a good thing. It's what drives innovation and price performance. With the release of two new A-series samplers, Yamaha is changing the landscape in the sampling wars with a couple of products that are destined to blow the competition away.

Whether you're a dance remix producer who wants to take advantage of all the cool loop-based features like BPM Time Stretching, Beat Remix and Loop Divide, or a studio player/producer who needs access to a huge library of top-quality instrumental sounds, the new A-series samplers come with everything you need. And at $1595 MSRP for the A4000 and $2295 MSRP for the A5000, their price performance is unbeatable.

So before you go out and buy one of the competitors' products, you owe it to yourself to try the newest and best sampler line up on the market. We're confident that once you compare us to the competition, you'll realize Yamaha samplers are the clear winners. And so are you.

*Manufacturer's Suggested Retail Price

The new Yamaha A4000 and A5000 samplers come bundled with 9 native-format CD-ROMS stuffed with thousands of exclusive Yamaha sounds. Get everything from drum loops to concert grand pianos right out of the box.

YAMAHA

KEY INFO #238

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RATINGS

10
Superb. Groundbreaking work.
8-9
Outstanding. Top of the pack.
6-7
Good. Solid and musical.
4-5
Average but usable.
1-3
Mediocre to poor.

Audio CDs or CD-ROMs (Akai S1000, E-mu, Roland, SampleCell, GigaSampler, SoundFont, WAV)
Percussion loops, fills, and individual instrument hits played by seven New York City percussionists. Styles include Afro-Cuban, Brazilian, swing, rock, funk.

SELECTION:	8
SOUND QUALITY:	8
DOCUMENTATION:	7
BANG FOR THE BUCK:	9

Sampleheads, 800-807-6056 or 212-262-3488, www.sampleheads.com

$99.95 audio CD set (2); $249.95 CD-ROM set (2)

SAMPLEHEADS
New York City Percussionworks

Back in October '95 we checked out Sampleheads' *New York Drumworks*, which Greg Rule cited as having "very good sounds and primo packaging." This month I listened to *New York Percussionworks*, a companion library of sorts that takes the same approach as *Drumworks*: tons of live loops and single hits played by NYC studio pros. Like *Drums*, *Percussionworks* is meant to inject the feel and vibe of its featured players into your MIDI-based productions, not serve up the definitive sample collection of percussion instruments.

Loops on this disc are performed at the same tempi used for *Drums*, the idea being to create full rhythm ensemble grooves by combining drum patterns from one library with percussion patterns from the other. This sounds good in theory, but a more user-friendly approach would be to offer a single construction-kit library comprising full ensemble loops along with each instrument component.

Ah, but how do the performances on *Percussionworks* sound? Excellent. And there's plenty of material to choose from — two CDs, in fact, chock-full of Afro-Cuban and Brazilian instruments and rhythms, with heavy helpings of "generic grooves" — swing, rock, and funk — designed to fit nicely into a variety of tracks.

Seven percussionists with impressive studio credits — Sammy Figueroa, George Jinda, Steve Thornton, Emedin Rivera, Mark Johnson, Tod Isler, and Mark Johnson (no relation to the other MJ) — were brought in to lay down their individual styles, resulting in a solid and varied cross section of rhythms, feels, and instruments.

I reviewed the audio version, which is divided into sections by player. The CD-ROMs, however, organize their contents by tempo and instrument; so, for instance, you can easily locate and load a bunch of different instrument patterns played at 104 bpm. Both formats give you three types of tracks/files: rhythm pattern loops, fills, and single hits. Pattern tracks on the audio CDs comprise recordings of a single groove performed at various tempi from slow to fast, which helps minimize the need for time compression and expansion. Single hits are played with four dynamics — mp, mf, f, ff — and are labeled accordingly. Start times for every hit and pattern are indexed down to a hundredth of a second, which is useful for finding and selecting a groove at a specific tempo when using a desktop audio-extraction utility.

On the whole, the recording quality is excellent. Individual sounds in the multi-instrument patterns have their own place in the stereo field. No effects processing was used, and there's very little room ambiance, making the sounds on *Percussionworks* a great point of departure for sound design and composition. In a handful of tracks, however, background voices, chair squeaks, and unwanted rumble can be heard.

The sound palette includes talking drum, conga, quinto, djembe, dumbec, timbale, clave, and other Latin and African sounds. Japanese crickets make an appearance, but you won't find any other instruments from the Orient, and strangely enough, there's no cuica. These minor exclusions aren't huge oversights. More significant is the lack of varied tunings for the hand drums; no high- or low-pitched conga, tumba, or dumbec — nothin'.

"Although they're played with lots of spirit," says Mark Vail, "the talking drum tracks on *Percussionworks* just don't thrill me like those from Q Up Arts' *Latin Groove Factory — Brazil* [reviewed Dec. '99], but the djembe, conga, and other patterns ooze Latin heat!"

While the documentation is better than some I've seen, it's nothing special. I appreciate its detailed and accurate time indexing; however, there are no usage instructions, no educational content, and no mention of how the library was created.

If your productions cry for a little percussion — or a lot — *New York Percussionworks* would be a fine choice. Considering the selection and the quality of performances, it's a steal. JOHN KROGH

KEY INFO #128

Pianos/Classic Keyboards (PCM01), Studio Essentials (PCM02)
Sound expansion boards & patches on floppy for Triton.

	PCM01	PCM02
MULTISAMPLE QUALITY:	7	8
PROGRAMMING:	8	8
DOCUMENTATION:	6	6
BANG FOR THE BUCK:	8	8

Korg, 516-333-9100, www.korg.com

$200 each

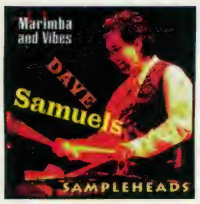
KORG
EXB-PCM01 & 02

Not only does Korg's Triton workstation provide 32MB of internal PCM ROM, but its soundset can be expanded with up to two EXB-PCM boards: 01 Pianos/Classic Keyboards and 02 Studio Essentials. Each lists for $200, contains 16MB of sound ROM, and can be user-installed. You get 32 multisamples on Pianos/Classic Keyboards, and 39 on Studio Essentials. True to Korg fashion, many of the programs and combinations on both are drenched in reverb — though a quick knob turn will usually decrease it.

Each board comes with a floppy disk containing 128 programs and 128 combinations that make use of the new multisamples. I checked them out on an 88-key Triton ProX (reviewed Sept. '99) and discovered some instruments were transposed up or down an octave, because they were programmed on 61-key Tritons and arranged so sensible ranges of the instrument

Dave Samuels – Marimba & Vibes

NEW!



The highest quality multi-samples of marimba and vibes ever recorded from the top mallet player of his generation,2 time Grammy award winner, **Dave Samuels**. Dave's credits include Gerry Mulligan, Oscar Peterson, Stan Getz, The Yellowjackets, Pat Metheny, Bruce Hornsby, Frank Zappa and Spyro Gyra.Multiple mallet variations (timbre) and dynamics. Chromatic samples of the entire range of the instruments: Yamaha 3-1/2 octave vibe and the rare Yamaha 5 octave rosewood marimba. Sustained & muted notes, rolls, riffs, and more!

Audio CD: $99.95 • CD-ROM $149.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

Pocket Syndrome Vol. 2: ROCK Guitar

NEW!

Groove Master ***Bernd Schoenhart*** (John Secada, George Michael, Kenny G, Slash, Marc Anthony, Dave Valentin, C+C Music Factory) does it again – this time focusing on rock guitar feels. All new unique "In The Pocket" rock guitar loops and riffs at multiple BPMs and keys per event. All loops are calculated to 1 or 2 bars, ready to load into your sampler or computer. Once again, Bernd performed in more than 20 unique styles, including the slamming "Rock-It-Pocket™", grouped by BPM, ready to give your tracks the "Pocket Syndrome Edge".

Audio CD: $99.95 • CD-ROM $149.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

KEY BUY KB KEYBOARD KEY BUY

"... the rock stuff absolutely burns. These grooves are right on the money."

Sound Quality: 9 (out of 10)

Keyboard Magazine, 11/99

SAMPLEHEADS

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NYC Drumworks

One of the best selling sample discs ever! 146 minutes of awesome rhythm played by 6 of New York City's top session drummers on this 2-CD audio or 2 CD-ROM set. Funk, rock, hip-hop, latin, R&B, Brazilian, rock-a-billy, reggae, gospel, country, thrash, funk and more funk + lots more! Kenwood Dennard, Shawn Pelton, Steven Wolf, Thommy Price, Dave Johnson and Frank Duncan played with sticks, blastix, brushes and mallets at multiple tempos per groove or style... The definitive collection of drum loops and matching hits from 6 of New York's finest. Maximum bang for the buck!

2 Audio CD set: $99.95 • 2 CD-ROM set $249.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

Pocket Syndrome Vol. 1: FUNK Guitar

Groove Master ***Bernd Schoenhart*** (John Secada, George Michael, Kenny G, Slash, Marc Anthony, Dave Valentin, C+C Music Factory) brings his unique "In The Pocket" guitar feel to this copyright free sample disc. 70 minutes – more than 700 "In The Pocket" guitar loops at multiple BPMs and keys per loop. All loops are calculated to 1 or 2 bars. Bernd played loops in more than 20 unique styles, grouped by BPM, ready to give your tracks the "Pocket Syndrome Edge". Your tracks will be come alive with that "funky guitar feel" – that you've only dreamed of achieving with your sampler or computer – until NOW!

"His funk drips with attitude... These grooves are right on the money."

Keyboard Magazine, 11/99

Audio CD: $99.95 • CD-ROM $149.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

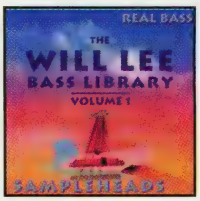
Will Lee: Ultra Freakin' Bass

More than 40 minutes of the most "In The Pocket" bass grooves, riffs and loops ever assembled, as performed by Bass Legend ***WILL LEE.*** Recorded at multiple tempos and keys in an array of styles that will keep you busy making music for a long time. Bonus: the audio version (2-CD set) also includes 5 new basses from the Will Lee Bass Library, sampled chromatically, featuring Will's most requested bass – the Sadowsky 4-string! So we call this audio disc "WLBL volume 2". The CD-ROM version is a single disc, just the loops, pre-looped and formatted, ready to eat.

Audio CD: $99.95 • CD-ROM $149.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

The Will Lee Bass Library



The disc that started it all! Recorded by the most in-demand bass player working today, "Bass Legend" ***Will Lee!*** The CD-ROM version contains 11 unique, world class, chromatically multi-sampled sampled basses from Will's private collection. Includes harmonics, mutes, slides, drops, thumbs, pulls, x-notes, and effects (as well as sustained notes at multiple dynamics) – all chromatically sampled! The audio version (vol. 1) contains 6 basses + a taste of WillLoops™. This disc has been used on countless hit records and films, by producers and programmers too numerous to mention!

Audio CD: $99.95 • CD-ROM $149.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

Whole Lotta Country

Another First from **SAMPLEHEADS!** The definitive collection of country instruments, performed by Country Guru, ***Larry Campbell.*** Includes Fiddle, Mandolin, Pedal Steel, Banjo, Dobro, Hi-String Guitar, Electric Telecaster, 6-string Bass, and Gut Bucket, all chromatically sampled to the highest SAMPLEHEADS standards. Plus, the most outstanding collection of country/acoustic loops, phrases and riffs ever assembled, including endings and fills. This double audio CD or 2 CD-ROM set will put a smile on anyone looking for "The Real Stuff".

2 Audio CD set: $99.95 • 2 CD-ROM set $249.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

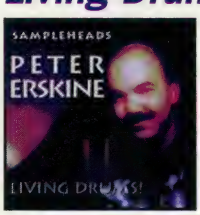
NYC Percussionworks

The follow-up disc to the blockbuster NYC Drumworks, Percussionworks is a 2 CD audio or 2 CD-ROM set featuring 7 of New York City's hottest percussionists. Hundreds of percussion samples, hits and loops, all meticulously recorded. Whether you are looking for that perfect conga part or a hip-hop tambourine groove, it's all here. The best part is that this library is totally interactive with NYC Drumworks (in tempo and style). The loops are some of the most useful tools ever recorded for a sample CD. Sammy Figueroa, George Jinda, Steve Thornton, Emedin Rivera, Mark Johnson, Todd Isler and Mark Johnson invite you to put "their pocket" into your music!

2 Audio CD set: $99.95 • 2 CD-ROM set $249.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

Peter Erskine – Living Drums!



One of the most amazing drummers in music today! Killer recordings of drum hits and loops played and selected by Peter from his collection of world class kits, compiled on this definitive collection guaranteed to make your tracks come alive. Actual Swinging 4/4 time! Odd-meter loops, Brazilian and Caribbean beats, Jazz, Pop & R&B Loops, transitions & endings, fills, loops, Ballad and brush performances, Multi-sampled drum kits w/textural, dynamic and timbral variations, Blastix/Rute, Mallets, Head/Rim hits, Multiple dynamics, Right & Left Stickings. Engineered by Allen Sides. KEYBOARD REVIEW: 5 stars!

Audio CD: $99.95 • CD-ROM $149.95

CD-ROM formats: AKAI (S1000 and compatible), E-MU (EOS/E4), GigaSampler, Roland 700 Series, SampleCell (Mac/AIFF), SoundFont, WAV files.

KEY INFO #133

Remember, It's All About The Music... It's All About Having Fun!

play across the shorter keyboard. By the time you read this, ProX owners will be able to download full 88-key versions of the same programs and combinations from Korg's website.

As you'd expect, Pianos/Classic Keyboards overflows with acoustic and electric pianos, organs, Clavinets, and harpsichords. Numerous variations on piano appear, including tack, toy, upright, and layered (with choir, strings, etc.). Specialized piano programs are in many cases better than the straight acoustic pianos, which aren't very realistic because they're generally too bright and thin, at least for a solo setting. On the other hand, they'll certainly project in a mix. Even what I consider the most usable for solo work, "Soft Grand 1 ST," suffers from a loud, obnoxious thunk in note attacks, which is supposed to be authentic but is too prominent.

In the EP realm, you get various renditions of Wurlitzer and Rhodes. One of the Clavs I particularly like is "Clav Talkin'," which combines auto-wah with a bit of velocity control to give the funky timbre a speaking quality. There are many smokin' B-3 programs to choose from, too. "The selection and quality of the organ sounds are great," declared John Krogh. "'Jazz Rotary' is a faithful reproduction of Art Neville's tone on classic Meters recordings, and 'Burnin' B' is perfect for mellow, Benmont Tench-like textures." When it's engaged, the Leslie effect's rotating speed is toggled using either the joystick or a front-panel knob. In fact, you'll find every program takes advantage of Triton controllers. Don't forget to kick in the arpeggiator, because even though it might be disengaged it's been programmed to do something appropriate with the sound.

Timbres get very deep, expressive, and fun when you enter combination mode. Many combis practically play themselves, as you'll find with "Groove<A>Motion": Playing a bass note simultaneously sets off a driving four-on-the-floor drum pattern and a Jeff Beck/Wired-like bass synth line that tracks your notes and plays in the current key. Meanwhile, your right hand gets a wicked, biting lead sound that distorts like crazy when you play multiple notes. This one rocks. With "70sOrgan(K1-4)" you get a combo organ that gets brighter as you crank the knobs; engage the arpeggiators and you've got instant disco bass line on top of a bass 'n' drum beat.

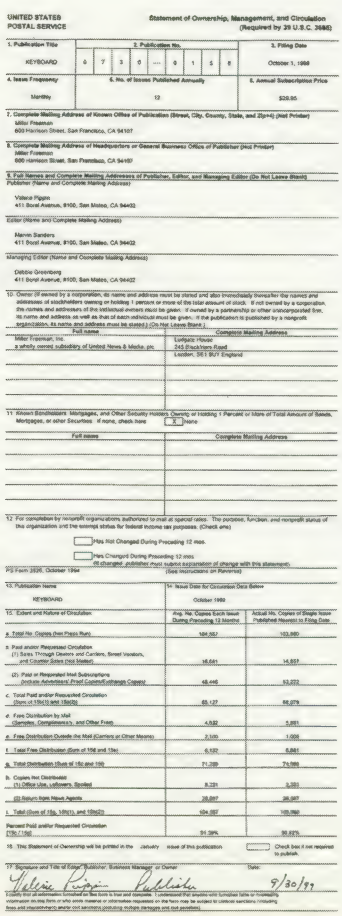
Included in Studio Essentials are individual instruments and ensembles: strings, brass, woodwinds, guitars, vocals, sitar, synths, and basses. While you get familiar vocal and choir multisamples, I can't help wishing that velocity-controlled syllables and phrases such as you'll find in competing synths had been included. But if you want New Orleans accordion, strummed sitar, big band horns, lush strings, and Bombay koto, they're all here and are beautifully conceived.

Among the Studio Essentials combis are full string and brass sections, multitrack arrangements with a kick-ass drum pattern combined with bass below the split point and a lead instrument above it, and gamelan-like arpeggiated patterns. "These are evocative and inspire creativity," John noted. "What more could you ask for from a set of sounds?"

Documentation is limited to a list of the titles and categories of all the programs and combinations, as well as the status and patterns of the arpeggiators. Controller assignments aren't detailed.

There are an awful lot of timbral enhancements for Triton on either EXB board. If you're into live performance and/or rock, check out Pianos/Classic Keyboards. Alternatively, those in need of orchestral and world sounds will find them on Studio Essentials. If your budget allows it, get both. MARK VAIL

KEY INFO #129



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e. Free Distribution Outside the Mail (Carriers or Other Means)	2,100	1,000
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Valerie Pippin, Publisher

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KEY INFO #111

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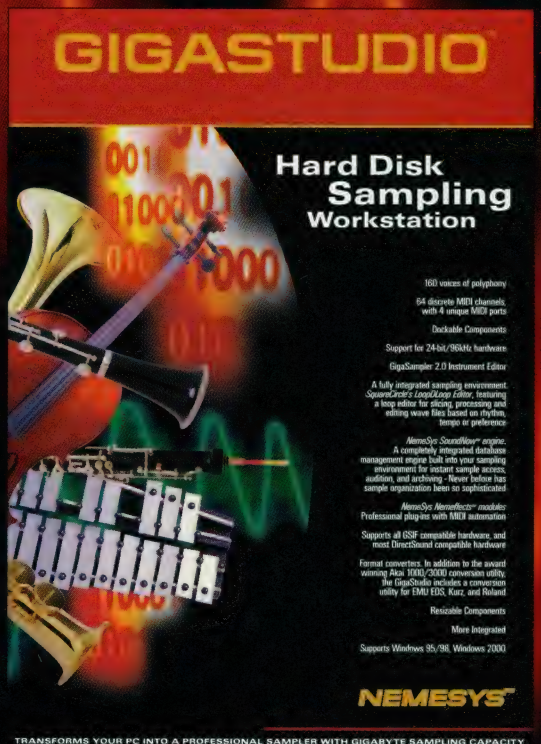

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KEY INFO #180

by Mark Vail

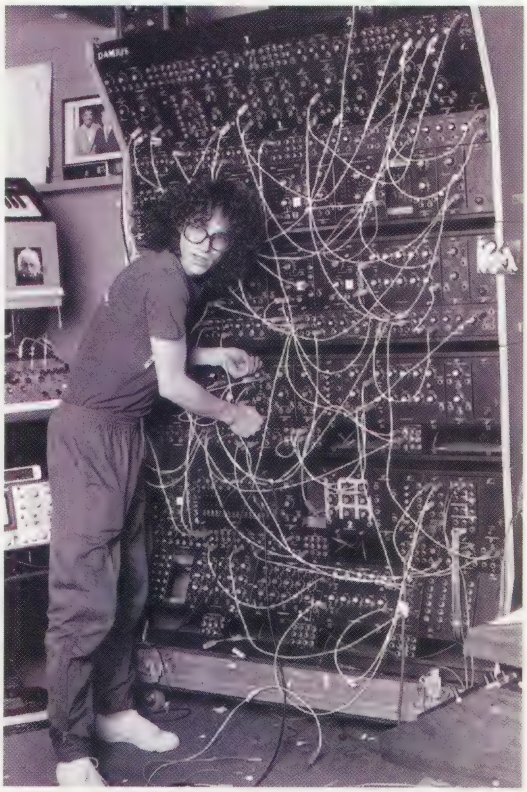
Perchance a Polyfusion

Lesser-known modular synth maker maintains a superb reputation

Most of the modular synth manufacturers of the '60s and '70s went belly-up. One that didn't fold is Polyfusion, although the company survived by diversifying away from the modular synth business.

Polyfusion was actually a spinoff from Moog Music. "We were frustrated," recalls vice president and co-founder Ron Folkman, "because we knew there were ways to make better products: more reliable keyboards and oscillators that wouldn't drift. The problem was, Moog Music owner Bill Waytena was fattening up the company for sale. He ultimately sold it to a big conglomerate called Norlin Industries, whose philosophy was 'less for more.' Since our ideas were falling on deaf ears, we decided to break loose and do what we knew how to do.

"The first system we delivered was a Polyfusion/Moog hybrid. The keyboard was from Moog and it used J-wires, exposed contacts that would corrode and become very intermittent. We later came out with an innovative keyboard that used reed switches, little glass-encapsulated contacts that are activated externally by a magnet. They'll even work under water, and they're immune to any type of corrosive environment. We mounted a circuit board underneath the keys with 51 reed switches on it, and then put a magnet on the bottom of each key. When you pressed a key down, it moved the magnet in proximity to the reed switch and turned it on.



Toto's Steve Porcaro with his Polyfusion "Damius" in 1982.

"The first couple of systems we delivered didn't even have voltage-controlled filters in them. We left blanks in the panels and told our customers they would get VCFs as soon as they were finished. That was okay with them.

"Bob Moog had a very nice filter circuit, and he had it patented. Obviously we didn't want to copy it, being new guys who were striking out fresh. We figured they'd probably be watching us fairly closely. To avoid any kind of patent infringement, I came up with something quite superior. It had more parts, but it worked better and was a lot quieter."

The Polyfusion oscillators were also superior. "A draft would send Moog oscillators off half an octave. The Achilles heel of that oscillator was the logarithmic current conversion circuit, which was very temperature-temperamental. We employed a heated transistor pair in a military TO-5 case — a little heated can — and they ran way above room temperature, so little variations in temperature had no effect on them. They had a 30-second warm-up time, and after that they'd drift maybe one cycle a week."

Proof that Norlin had odd ideas about how to do business: Polyfusion manufactured 100 vocoders designed by Harold Bode for Norlin at $1,500 apiece. Norlin put them on the market at $6,600. "They were way overpriced, and Norlin took them out of their product line after a few years. That essentially killed the Bode vocoder."

Does Folkman miss designing musical instruments? "In a way I do. Both my partner Alan Pearce and I have backgrounds in music. But typically you've got to chase people in the music industry to get your money, and I don't miss that." ■

Vital Stats

Produced: 1975 to 1985.

Description: Series 2000 modular analog synthesizers, synth modules, keyboard controllers, and other music products.

Total number of modular systems made: about 150.

Manufacturer: Polyfusion Electronics, Lancaster, NY; 716-681-3040; www.polyfusionaudio.com.

Insider information: David Paich and Steve Porcaro of Toto are long-time Polyfusion modular players (see Keyboard's Oct. '82 cover story). . . . A large Polyfusion modular system resides in Hans Zimmer's Media Ventures studio (see "Movie Music Magic!" in April '99). . . . Although they still make high-end home audio equipment, Polyfusion is no longer active in the music industry *per se*. The company now focuses primarily on the design and production of specialized electronic products, including industrial automation and robotics electronics. They have a Polyfusion modular on display in a conference room. . . . Polyfusion president and co-founder Alan Pearce has a doctorate in classical music composition. . . . Where did the name "Polyfusion" come from? "Alan Pearce attended some theatrical/dance/music/multimedia event in New York City called 'a polyfusion of the arts,'" co-founder Ron Folkman says. "He thought it was a neat name. If you break it down, it means 'a bringing together of many things."

Original retail prices: $3,450 for nine-module base system. Porcaro's eight-cabinet Polyfusion cost about $55,000.

Current value: $5,000 to $10,000 for a base system, $15,000 to $20,000 for a substantial system.

Look for a revised edition of senior associate editor Mark Vail's Vintage Synthesizers *book during the first quarter of 2000.*

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KEY INFO #186

www.electrixpro.com

by Doug Beck

Breaks and Rolls

Tips for setting up sections and building drama

As I reflected back on a few recent projects, something occurred to me: In order to make an effective dance record, you need more than just a slamming groove and a catchy synth hook. I mean, that goes without saying, right? But it's all about drama in clubland, and the most dramatic club records have dynamic rhythmic breaks and unconventional snare and tom rolls that momentarily interrupt the groove. Done right, the effect creates a buildup of tension followed by a rush of release when the beat slams back in, and the club crowd responds with heightened energy and enthusiasm.

Here we'll discuss some concepts and ideas for programming and creating dramatic breaks and rolls.

SYNCOPATED BREAKS

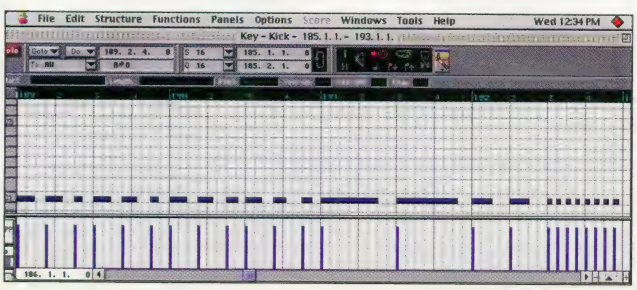
Let's start with rhythmic breaks. A stuttering or syncopated break can be used as a transition into a new section of the record or to set up a new element of the arrangement. Breaks are most commonly used to introduce high-energy parts of the track, such as choruses. Typically, every instrument and part is playing the same rhythm in unison, which creates a huge sound. This type of break usually works best in four- or eight-bars doses, but it can be shorter or longer if it feels right — whatever works.

While there are many approaches to programming a good break, I usually start with the kick drum. I'll program about four bars of a kick pattern (see screenshot below), then copy the pattern to every percussion part in the track (claps, hat, toms, cymbals, etc.). I'll edit each copied track by shifting its notes up or down so they trigger the desired percussion instrument. Now I have all of the percussion instruments playing precisely the same, tight rhythm. I like to set the velocity of the notes to around 100. If I open up the note velocity all the way to 127, it can be a bit of a letdown when the break is over and the groove comes back in; there should be a contrast in intensity between the rhythmic break and the high-energy segment that follows.

Next, I program bass and synth parts to play the same rhythm. What I end up with is a huge passage made up of all the instruments playing in unison, and this inevitably focuses attention on the rhythmic break.

The downside to this is polyphony choke or timing slop, depending on your rig. One workaround is to record a single hit from the break into your sampler, then edit the sequence so it triggers only the sampler. Instead of triggering ten or more notes, it now only has to trigger one.

For a vocal production or a remix, I often find a way to work a vocal snippet into the break as well. I look for something high energy to add to the hype of the break: a scream or high note that I can loop as the break plays. Check out an audio example of this on the new Boris & Beck remix of Jennifer Holiday's "Think it Over."



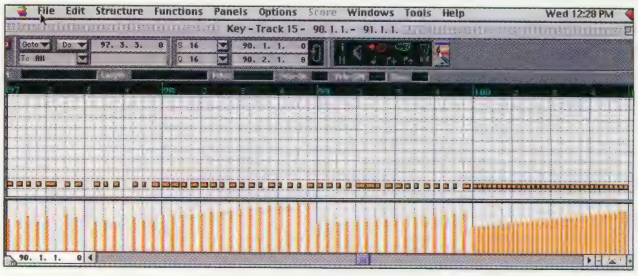
ROLLS

It's becoming more and more of a challenge to create a unique snare roll — something a little more interesting than the usual sixteenth-note variety. Here are a few ideas.

First, I like to use step-time programming for my snare rolls. In step-record mode, you can program very precise rolls, and, in doing so, you can sometimes stumble into happy programming accidents. One example: Let's say I want a four-bar snare roll. I go into step-record mode in my sequencer, and set the note value to sixteenth-notes. I'll program three bars of sixteenth-notes, then switch the note value to 32nd-notes for the last bar. Now I have a relatively simple four-bar snare roll. Then I like to "draw" the velocities of the notes. I tend to bring the note velocity up and down a couple of times during the roll to add tension, and then I go for a higher velocity level in the last bar. You can experiment with any values for any number of measures. Change it up, and try different combinations — you just might stumble on something great. (Check out the screenshot below to see how I draw the velocity.)

Also, don't limit yourself to eighths, sixteenths, and 32nd-notes. Try including triplets. And if your sequencer has "feel" or "swing" quantizing, experiment with various settings for all or parts of the roll.

Effects can dramatically color your snare roll and give it a unique character. Delays and flanges are great effects to try, but be careful with reverb. A little goes a long way, and the roll can end up sounding muddy or drowned out. I'm a big fan of filtering snare rolls. To add an interesting dynamic to the part, record the opening and closing of a lowpass filter as the roll plays into your sequencer. Start with the filter closed, and, as the roll comes to a crescendo, open the filter. This is a simple but very effective trick. [*For an audio example, go to www.keyboardonline.com.*]



Breaks and rolls should be more than afterthoughts; they are essential elements of a track. The energy of a good groove can be dramatically heightened when set off by a rhythmic break. Likewise, a great hook can be highlighted by a dramatic roll. It's worth investing the time to experiment with different approaches, using all the resources at your disposal.

Doug Beck is a producer/remixer/programmer living in NYC. Doug and his partner DJ Boris are busy doing remixes for many of today's top artists. Visit Doug online at http://dougbeck.home.pipeline.com.

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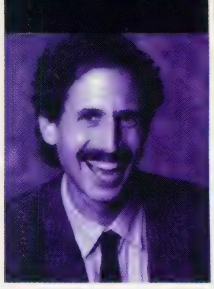
by Richard Leiter



Sonic Landscaping

Got a handle on studio ergonomics? Good. Now it's time for Acoustic Feng Shui

My friend Adam and I have gone backpacking in the Sierra Nevada mountains annually for 20 years. In all that time we've never been lost for more than an hour. Until last summer.

Late rains had washed out part of a trail and a subsequent fire had finished the job. Operating on the ever-popular Hubris Principle, we'd brought no compass and not enough water. Add to this the fact that this just happened to be the hottest weekend of the year. By mid-afternoon we were stupid from dehydration, frustration, and 50-pound packs.

But in spite of the sun-baked numbness, at two miles up we heard a piece of music to which we both responded instantly. It made us leap and fall to the ground. It cleared our minds and made our hearts flutter. And it was performed on just one instrument: a rattle, coming from between Adam's feet.

I'd never heard a rattlesnake except on the soundtracks of old cowboy movies. But my body sprang like an impala before I knew why. I was six feet back before I realized there *was* a snake. In fact, I didn't even see the thing, coiled and camouflaged on the burnt ground, until Adam, unhurt, pointed to it. The rest of the day was not fun. We were sobered by our narrow escape.

We were way lost. If one of us had been bitten, there would have been no way to score antivenin in less than 24 hours, and by that time the poison would have done real damage. Rarely have I so clearly understood the spinal-arc-reflex power of sound.

So this got me thinking about how I respond to other sounds. The distant sub-woofer rumble of jets taking off in the dark morning hours makes me apprehensive, even though I hear it every night. However, the ambient roar of Manhattan heard through an open hotel window ten stories up is comforting and helps me sleep. I can't stand one lousy garbage truck two blocks away at home. But sum the busted mufflers of 50,000 trucks, buses, taxis, fire trucks, cop cars, and screaming drunks and I'm Dr. Valium Goes To The Seashore. Why?

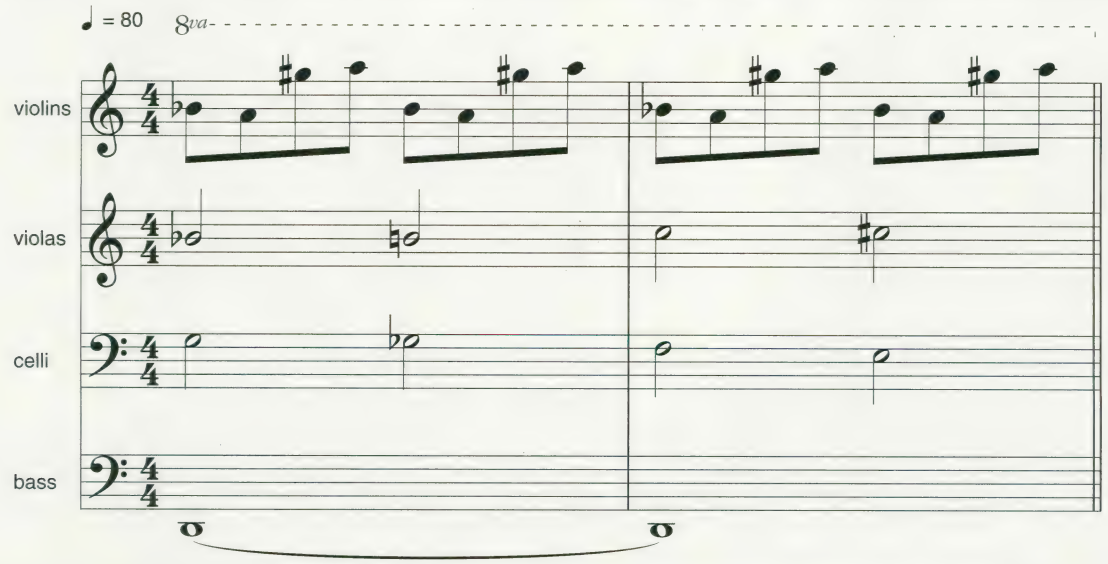
The answer is simple: Not too long ago — only 400 grandpas back — we were wild animals scraping around the forest just trying to make it through the night. And I don't mean 'cause your girlfriend left you. Lightning kills. Lions kill. Storms kill. Snakes kill. Other people kill. And they all make noise before they do it.

By the same token: Mothers nurture. Fathers protect. Oceans provide. Rivers nourish. Children delight. All their joyful noises are crucial to our survival.

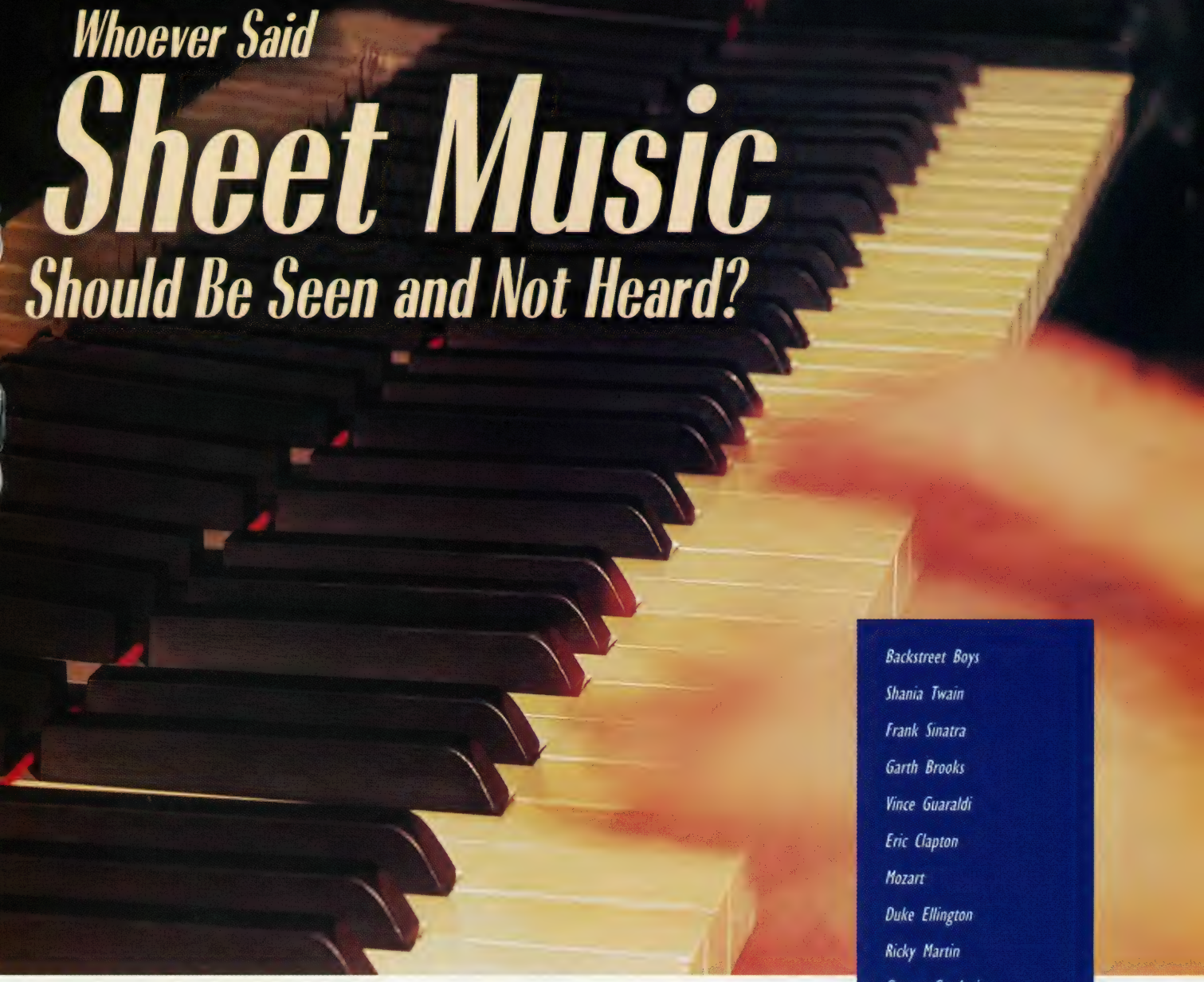
Leap with me now to a typical corporate office, the kind of place in which I often find myself presenting my reels. I get to see clients responding to my work on a survival level because their jobs depend on whether or not people like my music. This sometimes makes folks over-analytical. But more often than not, they are responding on a gut level. They're responding to the overall sound as much as the lyrics and melody.

Music exists on an audio continuum from low to high. If you unbalance that spectrum for long you'll make people nervous, and unless they want to be nervous they won't like your music. It's like Feng Shui for composers.

Want to make people uncomfortable? De-tune your kick drum patch way down and radically extend the decay. Rap producers do



Ex. 1. Hearing the top line alone would definitely cause some anxiety. But anchor that line with the richness of the lower string parts, and you're communicating something much more reassuring. Take off the top part, add a timpani roll beneath the lower parts, and you've got another feeling entirely. Put the top line and the timp roll together, and you've got another sonic spatial relationship altogether.



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- Vince Guaraldi
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- Chopin
- Beach Boys
- Sugar Ray
- Count Basie
- Eagles
- Beethoven
- Led Zeppelin
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this all the time when their music is supposed to make people uneasy.

One highly distorted screaming Marshall amp sounds bitchin'. Three sound really whacked to anybody but a 15-year-old boy whose mother won't let him go see *Fight Club* 'cause he's too young. (Am not. Are too.) It's just too much of what your limbic system knows is dangerous.

If you were watching a film and just heard the top line in Example 1, you'd be expecting something pretty bad to happen. But as you add the lower lines, the uneasiness is mitigated both harmonically and acoustically. Filling out the audio spectrum with less threatening noises takes us to a more sophisticated place emotionally. The anxiety is replaced by something more tolerable.

Conversely, take the gentle bottom three lines of the same example and throw a timpani roll beneath them and you can bet something exciting and positive is right around the corner. Now take the timp roll and put the top line over it. I see a bad moon rising, don't you?

On a practical level, you can use this approach every day in subtle ways. The next time your bass isn't slamming, don't just goose the EQ. That can help, but it can also de-focus the sound so that it competes with the vocal. Instead, try boosting the kick drum where it supports the bass by either adjusting the kick EQ or raising the kick volume. It sometimes makes you perceive the bass as louder and tougher.

Does your piece just not sound full? Rather than mucking it up with a thick string or synth pad, listen for the hole in the acoustic spectrum and add a single-note line. Not only will it sound pleasing acoustically, but you'll probably get a little extra harmonic mileage out of it as well.

The hole in the sound may not be that obvious. Think about the acoustic spectrum rather than a tonal solution; instruments provide a lot more than what meets the eye. When a jazz drummer is playing a steaming ride cymbal part, you're hearing a lot more than just tick-tick-tick. That cymbal is creating a pad of delicious upper-mid wash that does something wonderful to the mix.

You've got some mighty powerful spirits under your fingers. Use them wisely, grasshopper. ■

As a composer and songwriter, Richard Leiter has done projects for a wide variety of clients — NPR, Honda, Carl's Jr., ABC/TV, and Inglenook Wines among them. He writes and performs in California.

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by Craig Anderton

New Year's Resolutions

Still rehashing what you should have done during the 20th Century? Start the millenium right

I'm the kind of person who'd rather create than maintain, but over the years I've learned that attending to routine maintenance and cleanup — while boring — can definitely improve productivity. So here are some suggested New Year's resolutions to help get your studio in order.

◆ Periodically re-read the manuals for your most-used gear to discover shortcuts or tricks you may have missed. With printed manuals, use a light blue (not yellow) highlighter for particularly useful or obscure functions that might be hard to find otherwise. With online manuals, sometimes it's worth the effort (and paper) to do a printout so you have a reference that doesn't take up any screen space, and in which you can add notes.

◆Visit the Web sites associated with each piece of gear you own and check for updates, fixes, tips, new drivers, and the like. Sometimes you'll even find extra goodies, like free plug-ins or synthesizer patches. And while you're at it, if you're using a dial-up modem, upgrade to the next higher speed (*e.g.,* from 28.8K to 56K). The time you save will be worth the added expense.

◆ Inventory your gear. Write down all serial and model numbers. Even better, enter them in a database. Back this up with pictures; a video camera is ideal, as you can shoot the equipment while speaking the serial number and other descriptive info. You'll need this data for insurance purposes (although hopefully you'll never have to file a claim). Store your inventory data someplace secure, like a safe deposit box.

◆ Make sure you actually *have* insurance coverage. Most standard homeowners' policies don't cover music gear. Policies are available through ASCAP for their members, and some musicians use Clarion Associates (800-848-2534).

◆ If you use a DAT recorder often, have it professionally maintained at least once a year. You don't want a machine that could potentially chew up a one-of-a-kind tape.

◆ Send in the shareware fees for software that you use. It's not just the right thing to do; registering your software often gets rid of annoying reminders to send in your bucks, or unlocks additional features. And if you haven't checked out the shareware world recently, take a look. There are some really useful, inexpensive programs (some are even free) on the Web.

◆ Buy a can of compressed air. Blowing off a CD-R's surface before recording to it increases the odds of an error-free CD.

◆ Take the case off your computer and blow out any dust (another use for the compressed air can). Detach, then re-attach, each connector, to make sure that any self-wiping contacts clean themselves. Also do this with cards: Gently remove the card halfway (you don't need to take it all the way out), then re-seat it firmly back in its slot. Just be sure to ground yourself before touching anything inside the computer; even a small static discharge can fry sensitive electronic components! Also, unplugging the computer before you open the case is a good idea. Finally, make sure that the leads going to fans are securely attached. These leads are often thin, with small, clip-on connectors. If you move your computer around, they can work loose.

◆ Buy or make dust covers for your gear, and use them faithfully. Dust is almost as bad as heat to electronic gear. At the very least, use dust covers on your mixer and computer.

◆ If you live in a humid area or work in a basement, use a product like Damp-Rid (available at supermarkets and hardware stores). Damp-Rid consists of crystals that absorb moisture; you put them in a container that has holes at the bottom and sits on top of a tray or bowl. The crystals are quite effective at drawing moisture out of the air, and the only required maintenance is to empty the bowl periodically and replenish the crystals every week or two.

◆ If you're using a CD-R, upgrade to a CD-RW drive. A reusable storage medium is environmentally better (although for finished archives, I still use CD-R). Older CD-ROM drives couldn't read CD-RWs, but just about all of the newer CD-ROM drives can now read both -R and -RW types.

◆ Buy a small dictation-style microcassette machine or solid-state voice recorder, and keep it handy during sessions. These are useful for spur-of-the-moment note-taking (sometimes it's easier to press the record button and talk than it is to write) and capturing ideas. For example, if someone is improvising lyrics over a track, push record. You may capture some cool words that would otherwise be forgotten.

◆ Attend seminars at your local music store whenever the subject involves something you do. One of the great aspects of seminars is not just that you may pick up some useful tips, but that you'll get to meet and network with fellow musicians. This can lead to useful connections and collaborations.

◆ Similarly, if you use a particular computer, check your local paper to see if there are any user group meetings in your area. Attend a couple. You could encounter some friendly "gurus" who can help you more quickly and more knowledgeably than a lot of tech support people.

◆ While we're on the subject of tech support, the following tip may not benefit you directly, but it's still worth doing: If some tech support person really saves your butt, or if a store employee is particularly helpful, ask for the name of their superior and write or email a short note detailing your positive experience. People are often quick to complain, but slow to praise; nonetheless, making sure someone with merit gets recognition often does more good than having an incompetent person reprimanded.

◆ Devise a comprehensive backup and retrieval strategy. I've mentioned the importance of backup before, but with so many different media now involved in the backup process (floppies, Zip disks, CD-Rs, etc.), the issue of retrieval becomes vexing. Whenever possible, save everything related to a particular song or project on one medium, such as CD-R or cartridge disk. If that's not possible, keep a notebook that describes what files are on which media. For what it's worth, my current system uses CD-Rs for permanent archives, CD-RWs for periodic backups (like once every few weeks), and Zip disks for daily backup of files in progress. All tapes (DAT and ADAT) and MiniDiscs are numbered; a notebook has

a page for each tape or MiniDisc that describes the contents. It's not a perfect system (everything should be databased instead of in notebooks), but it works better than no system at all. [*Ed. Note: For more on data backup, see Studio Sense, Apr. '99.*]

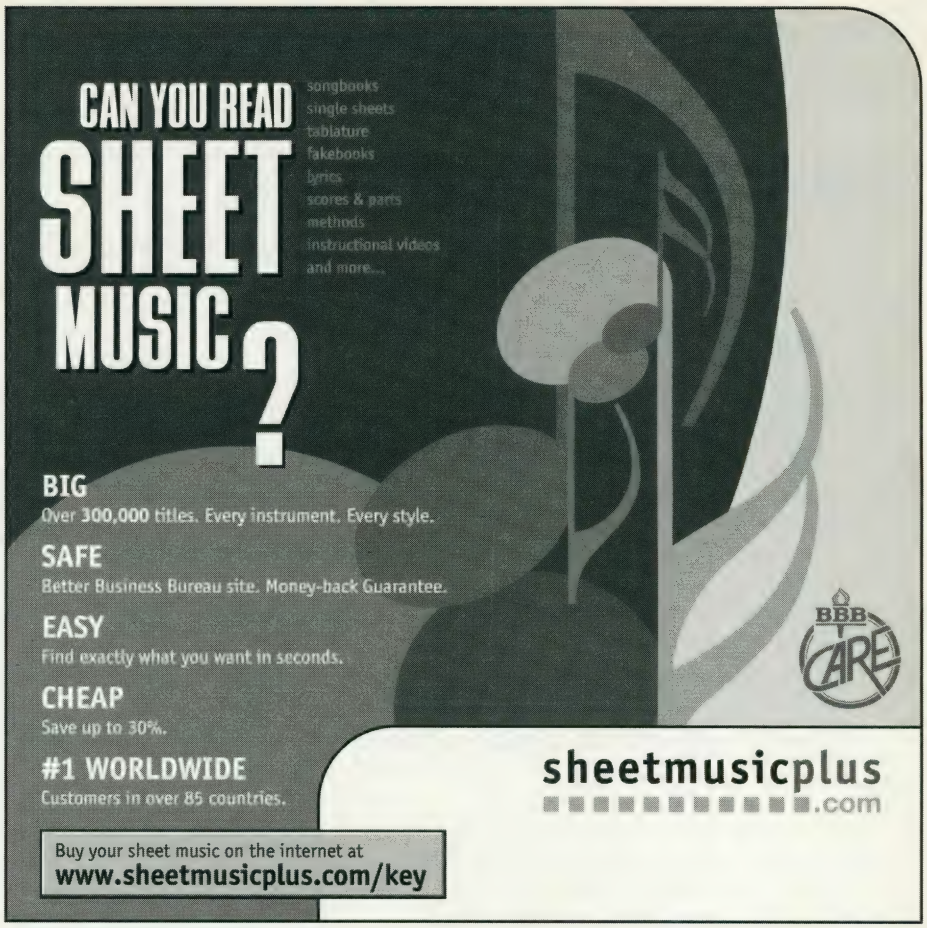
◆ Rent a safe deposit box to store really valuable work. They're only about $25 a year (or free with some checking accounts), which is cheap insurance. Buying a small fireproof safe for your studio is not a bad idea either — but in the event of a full-scale fire the inside of the safe could get hot enough to damage magnetic media.

◆ If you use a computer for recording, experiment with various user interface tweaks to create a more pleasant working environment. Sometimes just changing background colors makes it easier to stare at a screen for hours without fatigue. I prefer a medium gray desktop, and, for legibility, use yellow letters on a black background for highlights, menu bars, etc. Experiment with different screen resolutions, refresh rates, type sizes, fonts, and the like. Also make sure that ambient lighting doesn't cause screen reflections. Tending to these seemingly minor points can lead to much greater user comfort.

Some of the resolutions you might want to make don't relate to gear, but can improve the quality of your musical life anyway. If you're not into the groove scene, go to a club with a really good DJ and listen to what you've been missing. Sell off old gear that doesn't inspire you anymore, and get something new that does. Give a demo at a local school about making music with computers — the class will love it. If you're going to release a self-produced CD, take the time to consult with a professional mastering engineer to find out whether the job you did measures up sonically. And of course, renew your subscription to *Keyboard*. . . .

Okay, that's enough advice. As someone who has worked under both chaotic and ordered conditions, give me order any time. Now if I could only make that my permanent state of affairs! ■

Author/musician Craig Anderton has lectured in ten countries and 37 states on technology and the arts. He is the author of Home Recording for Musicians *and* Multieffects for Musicians *(available at www.musicbooksplus.com). Two of his tunes were recently remixed and released on German compilation CDs; his next CD,* Sexy World, *will also be available as an Acid loop library.*



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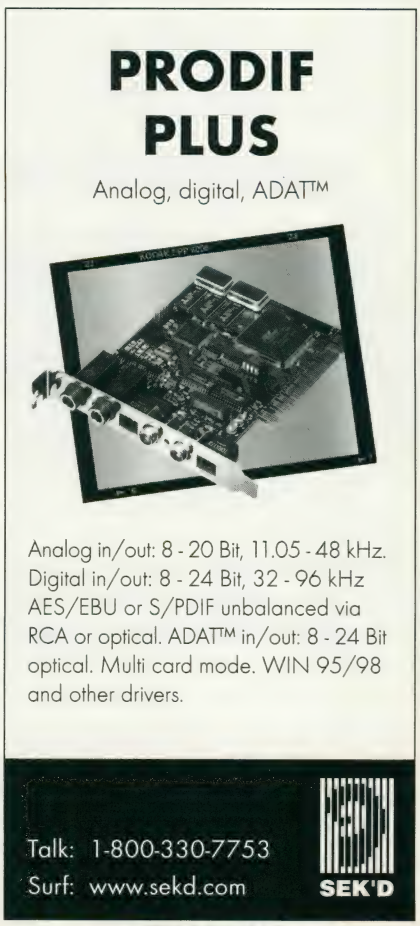

KEY INFO #55

by Jim Aikin

Digital Audio Details

Don't be spooked by slang or buffaloed by buzzwords

If you've been reading Basics for the past couple of months, you should have a fairly clear idea by now how sound gets stored digitally (either on a hard drive or on digital tape) and why a higher sampling rate and higher bit resolution make for more accurate recordings. This month we'll round out our coverage of digital audio by touching on a few key terms and concepts.

clipping: As explained in the Nov. '99 issue, an analog-to-digital converter (ADC) converts analog electrical signals into numbers. So what happens if the ADC has just used the biggest number it can, and the level of the analog signal keeps going up? In this situation, all the ADC can do is keep generating the same big number over and over. No matter what the audio actually sounds like, the digital recorder will essentially store a square wave (see Figure 1). This change in the sound is called clipping.

Digital clipping is nasty stuff. Folks who work with digital recorders quickly learn to adjust their input levels downward far enough to avoid clipping. At the same time, it's important not to turn the input down *too* low. In order to take full advantage of the dynamic range of your digital recorder, the input needs to be as hot as possible short of clipping.

data compression: Pro-quality digital audio is stored in *linear* form (usually 16-bit, 20-bit, or 24-bit linear). This means that the numbers stored represent the actual moment-by-moment measurements by the ADC of the incoming analog waveform. But especially at higher sampling rates and bit resolutions, linear digital audio takes up a pretty fair amount of disk space, and transmitting it from place to place requires a lot of bandwidth. As a result, various forms of data compression are used to squeeze the sound into a more compact form.

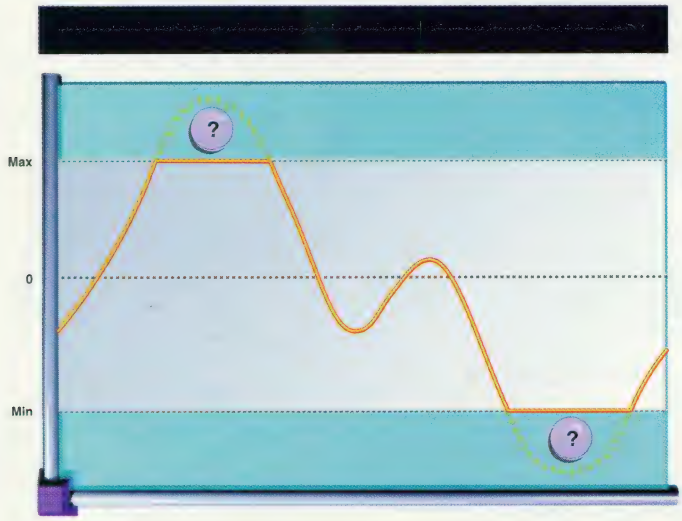

Fig. 1. When the amplitude (loudness) of an analog waveform (dotted line) is greater than the analog-to-digital converter can handle, the waveform that actually gets recorded (solid line) will be truncated (the flat-topped areas). The common term for this type of truncation is "clipping." Needless to say, the clipped sound no longer bears much resemblance to the original. If more than a few of the individual samples are clipped, you'll hear anything from a nasty click to a stream of metallic grinding sounds.

Data compression comes in two flavors — *lossless* and *lossy.* When lossless data compression is used, the original linear data can be reconstructed from the compressed data so that the copy is byte-for-byte identical to the original. In lossy compression, the sound quality is degraded in some manner in order to make the data more compact. MP3, for example, is a lossy compression scheme. This is why it's technically incorrect to say that MP3 has "CD-quality sound." By definition, CD-quality means linear 16-bit encoding at a 44.1kHz sampling rate. No matter how good the compression sounds, if it's lossy, it's not CD-quality.

Lossy data compression schemes for audio generally use some type of *perceptual coding.* This means that the encoder makes some assumptions about which portions of the digital signal are important to the human ear, and which portions can safely be discarded (or compacted into a more compressed data format) without causing too much change in the sound quality.

So if lossy compression causes changes in the sound, why not always use lossless compression? Because lossy compression is generally a lot more efficient. The audio can be compacted into less space, and transmitted more quickly. Anyway, as a user, you won't likely have a choice. Whether you're using MP3, Liquid Audio, or whatnot, you'll be using whatever type of compression that format supports.

dither: As noted above, digital audio recorders work most efficiently when the signal to be recorded is as hot as possible short of clipping. By contrast, a low-level sound is recorded with less fidelity. It's easy to see why this is so: If we're recording a very low-level sound with a 16-bit ADC, we may be using only three or four of the available data bits. Four-bit recordings are quite noisy. If you've ever used an old 12-bit sampler to record a sound that dies away smoothly to silence — a reverb tail, for instance — you'll have noticed the grungy little artifacts that show up at the very end of the sound.

Dither is a process of adding a tiny amount of controlled noise to digital sounds so as to make these artifacts less noticeable. The idea of adding noise in order to improve the sound quality may seem absurd, but it does work.

Dithering is often performed when the bit resolution of digital audio is being reduced — from 24-bit to 16-bit, for example. In general, it's a bad idea to dither a sound more than once. If you're doing file conversions for multimedia, for instance (where the final files may have a greatly reduced bit resolution), you generally shouldn't dither the signal until the last step.

DSP: Digital signal processing (DSP) is a catch-all term for processes that change the sound of digital audio in some way.

Digital reverb, equalization, and time-stretching are all examples of DSP. Some DSP works in real time, and some works offline. Offline DSP, which is often the only type you can use on an older, slower computer, is also called "destructive" or "file-altering," because it changes the contents of a file. But usually you don't *have* to destroy the original disk file in order to use DSP. You can apply DSP to a file and store the results to a new file, thereby keeping both the unprocessed and processed versions.

looping: When a given segment of digital audio is played back over and over, it is said to be looped. (If it plays once and stops, it's sometimes said to be in "one-shot mode.") Looping is basically a way of making short sounds last longer. We'll have a lot more to say about looping next month, when we start looking at sample-playback synthesis. If you can't wait, scout up a copy of the Fall '99 issue of *Keyboard* and read the cover story, "Make Music with Loops."

storage space: If you do the math, you'll find that a 16-bit stereo sound recorded at a sampling rate of 44.1kHz (that's 44,100 samples per second) requires 176,400 bytes per second. That's 10,584,000 bytes (about 10MB) per minute. With 24-bit audio, higher sampling rates, and more tracks of audio, the requirements in disk space mount up quickly. If you're playing back the audio from disk, you also need to be concerned with the read/write time of your disk and the throughput capability — the bandwidth, in other words — of your disk bus (typically EIDE, SCSI, or USB). We don't have space here to go into the details. Suffice it to say that multitrack digital audio can put some pretty stringent demands on a computer-based recording system.

word clock sync: When several digital devices are sending audio signals to one another, they have to be synchronized using some type of word clock. For example, let's say you have a synth and a computer, both of which are sending digital audio to a digital mixer. If you don't use word clock sync to synchronize (slave) two of the devices to the third one, the audio will quite likely acquire little clicks and pops. ■

Senior editor Jim Aikin is the proud owner of a new home. His studio is already wired up, but it's gathering dust while he discovers the dubious joys of yard work.

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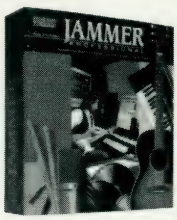

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KEY INFO #46

Around the Corner

How to prepare for the Next Big Thing

Welcome to the 21st Century. How are you enjoying it so far? I think many of us have dreamed and fantasized about crossing this boundary, and wondered what it would be like. The quality and nature of life at this juncture has been the subject of much speculation and thought, from movies to doomsday cults. But in reality 2000 just comes one day after 1999.

So what about music for the 21st Century? Does the dawn of a new millennium hold a key to a new style, approach, process, or technology? Growing numbers of people are experimenting with new forms of entertainment on the Web, on computers, or forms that are designed for hardware that does not yet exist. I've seen demonstrations of new platforms that have the promise of creating new interactive art forms. There are classes and workshops going on around the world on art, music, sound, and technology for "new media."

What's driving this apparent growth in people's desire to be entertained in new ways? It's the same essential, insatiable appetite we've always had for stories, whether told in words, songs, melodies, paintings, films, television, talking, gossip, email, chat rooms, or graffiti. This is basic to human nature, and we as artists are doing little more than satisfying that primary urge. Even the most emotionally repressed people get pleasure out of feeling things, both physically and emotionally. Those of us who have a difficult time being intimate with other real people still are interested in the emotions and feelings of others by way of stories.

As music makers, we bring something special and unique to the telling of stories. Even here in the 21st Century, no one really understands what it is about music that makes people react so strongly, to make them even laugh or cry. As such, music plays a pivotal role in giving films their emotional kick. Ultimately it makes little or no difference whether we understand why or not — understanding won't help to create a single note more beautiful than the ones we've had.

One of the goals that creators of new entertainment technologies have is to create art forms that are more "immersive" than any in existence today, stories that people will experience by being within them instead of merely observing. High-speed computing will allow audio-visual (and someday tactile) worlds to be created in real time that will not only provide images and sound for us, but also respond to our actions in ways that only the real world does. With sufficient technology, we could walk around inside a movie and learn more about what is going on with the characters and plot elements. Video games come close to this in concept (especially if you want to kill the person in the next room), yet they are not that engaging as a medium for storytellers.

Masterfully told stories, however, must be told a certain way, whether they're literary, oral, musical, or cinematic. The listener or observer, not yet aware of what will happen next, cannot improve upon the story in any way, and in fact shouldn't. Stories, like the way we experience our lives, are linear — no random access. Music is the same. A song or symphony is revealed to the listener one note at a time, and at the tempo the composer has chosen. Each note can be savored or experienced as it comes, and the listener is never bothered with deciding when the next note should occur.

For composers interested in becoming involved in the interactive media of the future, therefore, the challenges will be in how to create music that can change as the listener wishes while still maintaining some amount of melodic and emotional cohesion and integrity. It takes a great deal of talent and practice to know how to write a piece of music that gives the listener a satisfying and moving experience. You learn to pace yourself just so, to start out slowly (or not) and build upon that step by step until you reach the peak moment of the music, then return back down. Frankly, good music has more in common with good sex than any other art form. It's no wonder people often like to have music playing when they are in bed. Music is sexy because of the way it tells its story over time. How much of that power will get lost when listeners can decide to jump around in your music any way they want? While there may be some enjoyment for listeners to tinker with the art (or the story) they are currently experiencing, ultimately they will probably lose out on the greatest experience they could have had, which is to listen to music as the composer intended. Actually, I believe strongly that people will always want to experience art and music passively. New forms will come, but I don't think interactive entertainment will surpass traditional forms for a very, very long time.

In terms of new technology, things are moving fast, but no faster than they were several years ago. MIDI and digital audio were radical new ideas and tools for composers and musicians to use in making music. Nothing new currently has the same power to change how composers work, but there are developments that are improving our creative experiences all the time. Better sequencers, more DSP functions, easier to use and more powerful instruments, and a move to more computer-based processing are all great, but the dawn of the 21st Century doesn't seem to have anything profound up its sleeve quite yet. I hope that will change soon. It would be a bit boring otherwise.

In the meantime we continue to make stories. We score films (the greatest advance in story-telling technology history, even over the invention of the printed book), we write songs, jazz tunes, musicals, operas, and symphonies. We look for better technologies with which to make our music, and for ways to send that music out into the world for people to hear, and hopefully pay for. As new forums for our music come along, some of us will adapt to those methods. Others will not. At the dawn of a new millennium, as someone once said, the song remains the same.

For resources on interactive and other new media for music and sound, please go to my Web site, www.reelworld-online.com.

Jeff Rona is a composer and synthesist in Los Angeles. He's scored several films, including Ridley Scott's White Squall. *His TV scores include* Homicide: Life on the Street, Chicago Hope, High Incident, *and* Profiler. *The soundtrack of* Chicago Hope *is available on Sonic Images Records. Jeff can be reached at jrona@earthlink.net.*

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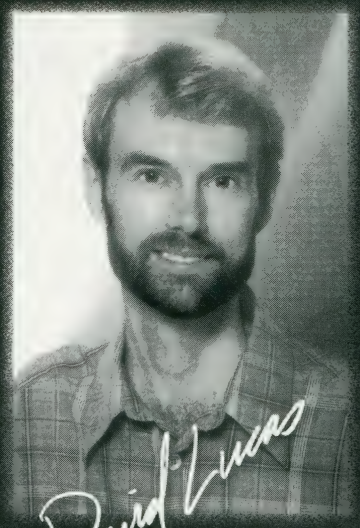

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It all started in ninth grade as a sort of teenage rivalry.

I would slave at the piano for five hours daily. Linda practiced far less. Yet somehow she always seemed to have an edge that made *her* the star performer of our school. It was frustrating.

What does she have that I don't? I'd wonder.

Linda's best friend, Sheryl, sensed my internal competition. One day she bragged on and on about Linda, adding more fuel to my fire.

"*You* could never be as good as *Linda*," she taunted me. "*Linda's* got *Perfect Pitch*."

"What's Perfect Pitch?" I asked.

Sheryl gloated over a few of Linda's uncanny abilities: how she could name exact tones and chords—*by ear*; how she could sing any pitch—*from memory*; how she could play songs—after just *hearing* them!

My heart sank. *Her fantastic EAR is the key to her success*. How could I ever hope to compete with her?

But later I doubted Sheryl's story. How could anyone possibly know F♯ or B♭ just by *listening?* An ear like that would give you a mastery of the entire musical language!

It bothered me. Did she *really* have Perfect Pitch? I finally got up the nerve, approached Linda, and asked her point-blank if it was true.

"Yes," she nodded to me aloofly.

But Perfect Pitch was too good to believe. I rudely pressed, "*Can I test you sometime?*"

"OK," she replied cheerfully.

Now she'd eat her words . . .

My plan was ingeniously simple: I picked a moment when Linda least suspected. Then I boldly challenged her to name tones for me—*by ear*.

I made sure she had not been playing any music. I made her stand so she could not see the piano keyboard. I made certain that other classmates could not help her. I set everything up perfectly so I could expose her Perfect Pitch claims as a ridiculous joke.

The tension mounted as I plotted my strategy. Linda appeared serene. Then, with silent apprehension, I selected a tone to play. (She'll *never* guess F♯!)

I had barely touched the key.

"F♯," she said. I was astonished.

I played another tone. She didn't even stop to think. *Instantly* she announced the correct pitch.

I frantically played more tones, skipping here and there all over the keyboard. But somehow she knew the pitch each time. She was *AMAZING*—she knew tones as easily as colors!

"How in the world do you do it?" I blurted. I was totally boggled. (Autumn 1970)

"Sing an E♭," I demanded, determined to mess her up. She sang a tone. I checked her on the keyboard—she was right on!

Now I started to boil. I called out more tones, trying hard to make them increasingly difficult. Still she sang each note perfectly on pitch.

I was totally boggled.

"*How in the world do you do it?*" I blurted.

"I don't know," she sighed. And to my dismay, that was all I could get out of her!

The dazzle of Perfect Pitch hit me like a ton of bricks. My head was dizzy with disbelief. Yet from that moment on, I knew *Perfect Pitch was real.*

I couldn't get it . . .

"*How does she DO it?*" I kept asking myself. On the other hand, why can't *everyone* recognize tones by ear? It dawned on me that most musicians can't tell a simple C from a C♯, or the key of *A major* from *F major*!

I thought about that. A *musician* who can't tell tones by ear?! That's as strange as an artist not knowing the rainbow colors of paint on his palette! It seemed odd and contradictory. I found myself even more mystified than before.

Humiliated and puzzled, I went home to work on this problem. At age 14, this was a hard nut to crack.

You can be sure I tried it for myself. I would sweet-talk my three brothers and two sisters into playing tones for me; I would try to name them by ear. But I found it was a guessing game I just couldn't win.

I tried hard to feel the "highness" or "lowness" of each pitch. I played tones *over* and *over* to get them to stick in my head. Day after day I tried to memorize those elusive tones, but nothing worked. After weeks of pure nothing, I still couldn't get it.

I had to admit that Linda had an extraordinary gift—the ultimate ear for music, a master key to many talents. I wished I had an ear like that. But I realized it was way beyond my reach.

So finally, I gave up.

Then it happened . . .

It was like a miracle. A twist of fate. Like finding the lost Holy Grail . . . Once I had stopped *straining* my ear, I started to listen NATURALLY. Then the incredible secret to Perfect Pitch jumped right into my lap.

I began to notice faint "colors" within the tones. Not *visual* colors, but colors of *pitch,* colors of *sound*. They had always been there. But this was the first time I had ever "let go"—and really *listened*—to discover these subtle differences.

Soon—to my own disbelief—*I too could recognize the tones by ear!* It was simple. I could hear how F♯ sounds one way, while B♭ has a *different sound*—sort of like "hearing" red and blue.

The realization struck me: THIS IS PERFECT PITCH! This is how Bach, Beethoven, and Mozart could mentally envision their masterpieces—and know tones, chords, and keys all by ear—*by tuning in to these subtle "pitch colors" within the tones.*

It was almost childish—I felt sure that *anyone* could unlock their own Perfect Pitch by learning this simple secret of "color hearing."

Bursting with excitement, I went to tell my best friend, Ann (a flutist). But she *laughed* at me.

"You have to be *born* with Perfect Pitch," she gently asserted. "You can't *develop* it."

e-mail: PerfectPitch@EarTraining.com

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New!!

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The long-awaited brand new Perfect Pitch® Ear-Training SuperCourse—totally revised, expanded, and updated… after 19 years!!

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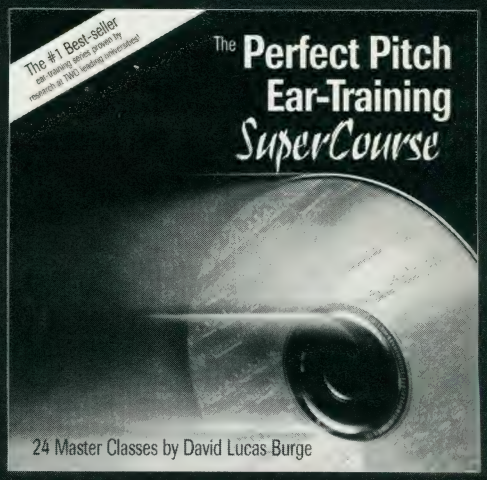

For ALL musicians of ALL instruments, beginning and advanced. No music reading skills required. Two FREE bonus CDs/tapes included with this special offer (see below)!

"You don't understand what Perfect Pitch *is*—or how it works," I countered. "I couldn't recognize a single note before. Now it's *easy*." I showed her how to listen. Timidly, she confessed that she too could hear the pitch colors. With this jump start, Ann soon realized she had *also* acquired Perfect Pitch.

We became instant celebrities. Classmates made us sing tones on command; they played tones and chords for us to name by ear; they asked us the keys that songs were in—endlessly fascinated with our "supernatural" powers. Yet to Ann and me, Perfect Pitch wasn't *super* natural—just natural.

Way back then I never dreamed I would cause such a stir among college music teachers. But as I started to explain my discovery to the academic world, many professors *laughed* at me. You must be *born* with Perfect Pitch," they said, "you can't *develop* it."

I would listen politely. Then I'd reveal the simple secret—*so they could hear for themselves*. You'd be surprised how fast they changed their tune!

As I continued my college studies, my so-called "perfect ear" allowed me to progress faster than I thought possible. I even *skipped over* two required music courses. Perfect Pitch made *everything* easier—performing, composing, arranging, sight-reading (because you can tell the notes you're playing without looking), transposing, improvising—and my *enjoyment* of music skyrocketed. I learned that music is definitely a HEARING art.

As for Linda? Oh yes—I'll have to backtrack . . .

It was now near the end of my senior year of high school. I was almost 18. In three-and-a-half years with Perfect Pitch, my piano teacher insisted I had made ten years of progress. And I had. But driven by youthful ambition, I still wasn't satisfied. I needed one more thing: *to hear Linda. And now was my final chance.*

The University of Delaware hosted a music festival each spring, complete with judges and awards. To my horror, they scheduled me as the last person to play—the *grand finale* of the entire event.

The fateful day arrived. Linda gave her usual sterling performance. She would be tough to match. But my turn finally came, and I went for it.

Slinking to the stage, I sat down and played my heart out. Later, on the bulletin board, I discovered I had scored an A+ in the most advanced performance category. Linda only got an A.

Sweet victory was music to my ears—mine at last!

Now it's YOUR turn!

For 19 years now, thousands of musicians around the world—plus research at two leading universities—have proven this simple Perfect Pitch method that I stumbled upon as a teenager. Now I'd like to show YOU how to experience Perfect Pitch *for yourself!* I've put everything I know into my **Perfect Pitch Ear-Training SuperCourse**. *It's fun*—and it's also *guaranteed* to work for you—regardless of your instrument, your playing style, or your current ability level.

Try it for yourself! Order your course and listen to the first two Master Class sessions. I promise you will *immediately* hear the Perfect Pitch colors I'll start you on—*or return the course for a full refund* (you've got my word on it). Or check out your progress with no risk. You'll find a dramatic improvement in your *pitch* and your *playing*—in only 40 days—or *I'll personally make sure you get your refund, no questions asked.*

Think how Perfect Pitch would improve *your* playing, *your* singing—*your own* creativity and confidence. And picture your friends' faces as YOU name tones and chords with laser-like precision! Please, don't you laugh, too! Just lend me your ear—and I'll show you the simple secret to *your own* Perfect Pitch!

SPECIAL OFFER: Try the course *right now* and you'll also receive my 74-minute companion CD on Relative Pitch ($10.95 value), yours to keep FREE *—even if you return your course for a refund!* Plus you'll get Perfect Pitch for Children ($14.95 value)—*FREE!*

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or CALL NOW 1-515-472-3100
See our NEW site at: EarTraining.com

KEY INFO #85

Our Guarantee:

You will experience Perfect Pitch for yourself—or you get a full refund!

❑ **YES!** Prove to me that I have Perfect Pitch! I'll try out the Perfect Pitch® Ear-Training SuperCourse—with the full *40-Day Money Back Guarantee*—for just $139 plus $6 for Priority Rush shipping. I'll start by listening to the the first five CDs (or tapes). I must notice an *immediate* and *dramatic improvement* in both my *pitch skills* and my *playing*, or I'll return the course for a full prompt refund—*no questions asked*. If I decide to continue my Perfect Pitch training, I can open the remaining three CDs/tapes (all included) for the advanced lessons. My FREE 74-minute CD/tape on Relative Pitch is mine to keep (a $10.95 bonus)—even if I return my course for a full refund!

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Also included FREE: Perfect Pitch for Children! ($14.95 gift)

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INSTRUMENT(S) YOU PLAY (please include VOICE if applicable)

Make check or money order payable to **EarTraining.com**. Canadian postal money orders are welcome in U.S. funds. Shipping charges for orders outside USA and Canada: $5 for more information, or $16 for the Perfect Pitch Ear-Training SuperCourse (via airmail). *U.S. funds only.* Iowa residents add 5% tax.

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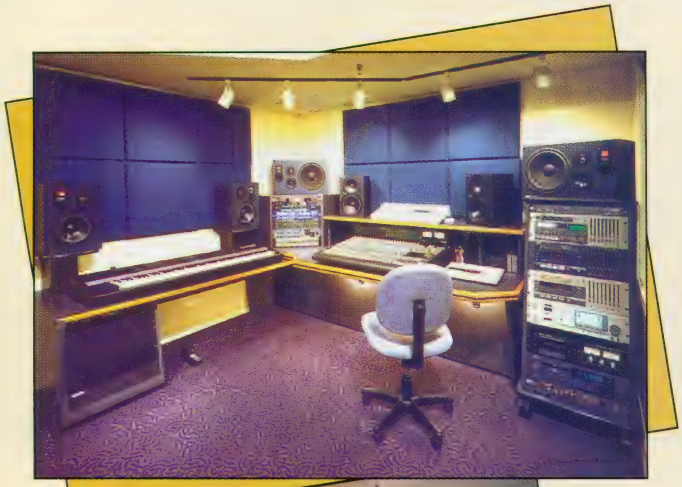

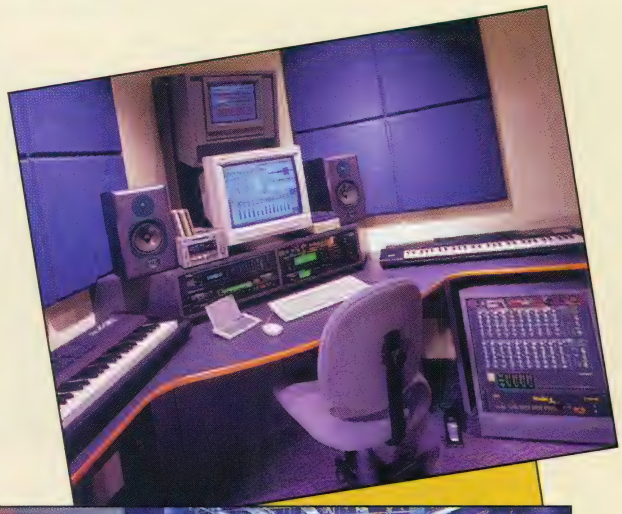

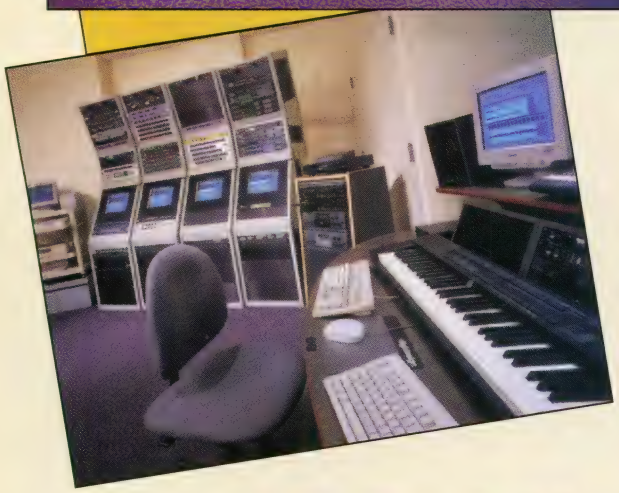

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SOUND MODULES, SAMPLERS & DRUM MACHINES

Roland

JP8080 Analog Modeling Synth Module

The new JP8080 builds upon the success of the popular JP8000, offering an advanced Analog Modeling sound engine with 10-note polyphony, powerful external audio synthesis, a built-in Voice Modulator all in a 6U rack design. With tons of front panel controls, the JP8080 gives you the best of the analog world with all the benefits of digitalis borealis.

FEATURES–

- Powerful Analog modeling synth with 40 knobs and sliders for realtime sound creation
- 7 onboard waveforms include Super Saw, Triangle Modulation, Noise, Feedback Oscillator, Square (PWM), Sawtooth and Triangle.
- 10-voice polyphony and Unison function for even fatter analog sounds reminiscent of older analog synths
- External audio synthesis allows for processing external audio sources using synthesizer filter, amplifier and multi-effects for very unique sonic possibilities.
- Powerful onboard Voice Modulator allows external Mic/Vocal/Instrument input to be processed in realtime using one of three unique modes: Formant Filter, Filter Bank, & Vocal Morph Control
- 3 independent onboard effects include Delay. multi-effects like Chorus, Flanger & Distortion, & Tone Control
- Onboard Motion Control remembers all slider and knob movements for hands-free playback
- Onboard Arpeggiator and realtime phrase sequencing
- Bank & Number buttons, Preview functions, & dedicated MIDI remote keyboard in
- SmartMedia slot accepts external 2MB and 4MB SmartMedia cards for unlimited pattern and patch storage and direct pattern playback

JV2080 64-voice Synthesizer Module

Roland resets the standard with the incredibly expandable JV-2080 64-Voice Synthesizer Module. This amazingly powerful package offers unprecedented expandability, digital signal processing, and remarkable operational ease, all housed in a 2-unit rack-mount design.

FEATURES–

- 64-Voice polyphony / 16-part multitimbral capability.
- 8 slots for SR-JV80 series expansion boards.
- 3 independent effects sets plus independent reverb/delay and chorus.
- 6 outputs, Main Stereo and 4 assignable.
- **NEW** *Patch Finder* and *Phrase Preview* functions for easy access to the huge selection of sounds.
- Large backlit graphic display
- Compatible with the JV-1080, XP-50, and XP-80.

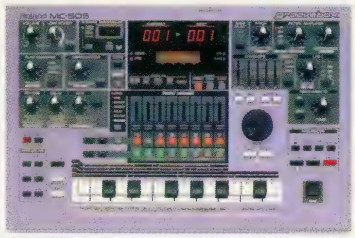
SR-JV80 Series Expansion Boards

Roland's SR-JV80-Series wave expansion boards provide JV and XP instrument owners a great-sounding, cost-effective way to customize their instruments. Each board holds approx. 8Mb of entirely new waveforms, ready to be played or programmed as you desire.

Boards Include–

Pop, Orchestral, Piano, Vintage Synths, World, Super Sound Set, Keys of the 60's & 70's, Session, Bass & Drums, Techno, Hip-Hop, Vocal and Asia Collection, Special EFX and Orchestral II.

MC-505 groovebox



The MC-505 groovebox builds upon the success of the MC-303 as a self-contained, retro-styled dance music sequencer and sound module with newly upgraded sounds and powerful, futuristic features. Among these new features are the revolutionary D-Beam controller and a MegaMix function for intuitive realtime mixing of beats and patterns- making the MC-505 a DJ, hip-hop, techno or dance music artist's dream come true.

FEATURES–

- 64-voice polyphony, steeper filters, ADSR envelope for editing sounds, powerful effects.
- 714 onboard dance music patterns developed by cutting edge sound designers worldwide.
- 512 built-in sounds, 26 rhythm sets
- Three independent, synchronized effects processors
- Powerful onboard Arpeggiator
- SmartMedia slot accepts external 2MB and 4MB SmartMedia cards for unlimited pattern and patch storage and direct pattern playback

ALESIS QSR 64-voice Synth Module

The QSR provides true 64-voice polyphony, and a huge sound library that is constructed of 16-bit linear samples. With powerful computer and digital audio interface capability, built-in 4-bus Multi-effects and expressive performance features, there is sure to be a QS synth that's right for you.

FEATURES–

- 16-bit 48kHz sample ROM
- 64 voice polyphonic
- 512 preset, 128 user internal program memory
- 400 preset, 100 user mix memory
- RS422, RS232 port formats
- ADAT interface*
- 16MB internal, 16MB expansion memory (32MB total possible)*
- 4 outputs (2 main, 2 aux)*

ALSO AVAILABLE:

QS6.1 - 61 keys, synth action

QS7.1 - 76 keys, synth action

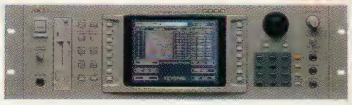
QS8.1 - 88 weighted keys

Sound Bridge Sample management software is available for Mac or PC, allowing you to import, save, and playback almost any sample type using your Alesis QS synth.

**Available on QS7.1 and QS8.1 only*

AKAI

S5000 & S6000

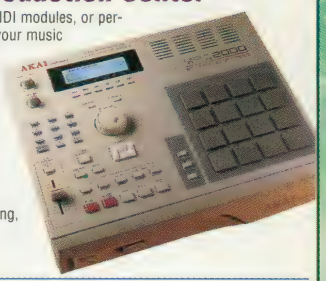


Two new radically redesigned samplers from Akai offering more power, greater speed and ease of use than ever before. DOS and .WAV file disk and sample format is used allowing seamless swapping of files between the sampler and your computer.

FEATURES- • Up to 256MB of RAM (8MB Standard)

- 64 note polyphony expandable to 128 w/ VOX64 upgrade
- 2 SCSI ports, BNC wordclock input standard
- Large backlit 320x240 LCD display (removeable on S6000)
- 8 outs expandable to 16 w/optional IB-S508P (included w/S6000)
- Optional IB1616A Adat interface, EB20 20-bit multi-effects

MPC2000 MIDI Production Center



Whether your producing rap or hip-hop, sequencing a rack of MIDI modules, or performing live, the MPC2000 gives you powerful tools to make your music shine. Its the NEW MPC!

FEATURES–

- Large 248 x 60 LCD Graphic display
- 64-track, 100,000 note sequencer with linear drum machine style programming.
- 16-bit, 32-voice stereo sampler
- Standard SCSI interface
- Soft keys, Data/Digit wheels, cursor control and more.
- Keypad for directly entering sample points.
- Note variation slider gives you realtime control of any sound's tuning, attack, decay, or filter frequency.
- Floppy Disk Drive
- Powerful expansion options.

E-mu Systems, Inc.

E4XT ULTRA Professional Sampler

The Emulator legacy continues with the new ULTRA series from E-mu. Based on the EIV samplers the new 32-bit RISC processing of the E4XT guarantees faster MIDI response, SCSI, DSP and sampling.

FEATURES–

- 128 voice polyphony • 64mb RAM (exp. to 128)
- 3.2GB Hard Drive • Dual MIDI (32 channels)
- 24-bit effects processor
- 8 bal. outs (exp to 16)
- Word Cloack& AES/EBU I/O • EOS 4.0 software
- 9 CD ROMS over 2GB snds
- Optional Adat card offers 8 ins/ 16 outs

AUDITY 2000

This sample based synth module has over 640 sounds. It combines advanced synthesis capabilities with powerful rhythmic generators and realtime controlers that allows you to create an unlimited number of unique sounds and rhythmic sequences.

FEATURES–

- 12th order resonant modelling filters
- 16 channel, fully synchronizable Rhythm Pattern/Arpeggiator
- 640 ROM presets/ 256 user presets
- 24-bit dual stereo effects processor
- 6 audio outputs
- Strereo digital output S/PDIF
- 16-part multi-timbral
- 32 voice polyphony
- Expandable sound ROM
- 4 realtime control knobs

PROTEUS 2000

The new heir to the Proteus legacy has arrived with polyphony and expansion capabilities never heard of before from any other sound modue. Over 1500 presets ranging from lush, pristine acoustic and electric instruments to some of the deepest synth patches imagineable.

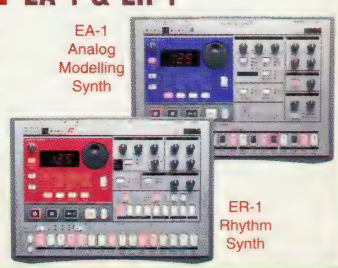
FEATURES–

- 128 voice polyphony
- 32MB of RAM expandable to 128MB
- 32-bit processing
- 32 MIDI channels
- 1024 presets and 512 user presets
- 12 front panel realtime controls
- 24-bit dual stereo-effects processor
- SoundNavigator allows you to easily find the right preset
- S/PDIF digital output

KORG

ELECTRIBE EA-1 & ER-1

Analog Modeling Dance Tools



Two analog modeling synth boxes that create phat, rich grooves with verstaile hands-on control and pattern based sequencing. Both units have a capacity for 256 patterns and 16 songs, have built-in effects and allow you to input external audio sources for realtime processing. As well, both units have tap tempo and MIDI clock and are controllable from an external sequencer.

The EA-1, Analog Modeling Synthesizer allows you to create 2 part sequenced phrases. A plethora of filter and dynamic effects are recordable in realtime.

The ER-1, Rhythm Synthesizer allows you to compose your own analog style beats with deep realtime control of effects and oscillators.

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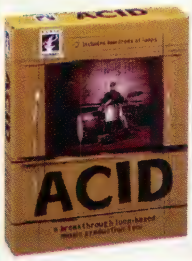
AUDIO SOFTWARE & PLUG-INS

SONIC FOUNDRY®

Sound Forge 4.5

Sound Forge 4.5 is professional editing software for Windows that contains an extensive set of audio processes, tools, and effects for manipulating audio. Features a built-in batch converter, a powerful spectrum analyzer, and an advanced loop editing toolset with support for Sonic Foundry's 'ACID' (see below). This diverse feature set lends Sound Forge to multiple applications including music production, multimedia development, sound design, audio for the Internet, broadcast production and sound analysis.

ACID Real-Time Party on the PC!



Sorry for the hype intro, but we have to let you know that this is NOT just another sequencer program with a few minor tweaks, this is the newest, hippest thing to come out in a very long time. ACID allows you to play .WAV, .AIFF and other sound files together matching their pitch and tempo in realtime. You've got to see it to believe it!

FEATURES–
- Make changes to tempo and pitch on-the-fly.
- Match loop tempo and pitch to a project in realtime
- Multiple track looping and editing
- Volume, pan and effects envelopes per track
- Master or slave to SMPTE timecode
- Works on Windows 95 & Windows NT systems

ASK US ABOUT SONIC FOUNDRY's .WAV FILE
LOOPS FOR ACID
LIBRARIES ON CD ROM

bias
berkley integrated audio software

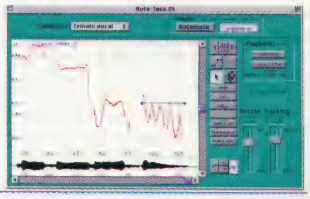
PEAK 2.0 2-Track Editing For The Mac

Intuitive, easy to use 2-track editing software for the Power Macintosh. 24 and 32-bit file support is ideal for music mastering. SMPTE synchronization and quicktime movie import capabilities for editing audio for film and video. A host of compression algorithms such as QDesign make editing audio for the web a snap. Most major professional samplers are also supported and the Loop Tuner helps create perfect loops every time.

FEATURES–
- Support for 24 and 32-bit audio files
- Digidesign DAE support
- TDM & Audiosuite Plug-in support
- Real-time Adobe Premier Plug-ins
- Playlist direct CDR Burning
- Quicktime movie window
- SMPTE synchronization
- Sampler support
- Loop Tuner helps create perfect sample loops

ANTARES

Auto Tune Plug-in For Mac or PC



Intonation correcting multi-platform plug-in for Mac and PC considered to be the "Holy Grail of recording" by Recording magazine. Auto-Tune corrects pitch and intonation problems on voice and solo instruments without distortion or artifacts. Two modes of operation include Automatic where pitch is continously compared to a user selected scale and Graphical mode offering more precise control allows you to draw specific target pitches. Compatible with TDM, VST MAS and standalone on the Mac and DirectX or DAL V8 on the PC.

WAVES

Native Power Pack

Uses the CPU of your Mac or PC to provide top quality effects processing for recording, mixing and multi-media applications. Compatible with many popular audio editing software programs, the NPP provides EQ, Reverb, Compression, Gating, Stereo Imaging and the incredible L1 Ultrmaximizer mastering peak limiter. It also includes Wave Convert, a stand alone application that batch converts formats, bit-depths & sample rates for the loudest, cleanest multimedia files available. A must have for recording engineers & internet designers alike.

Native Power Pack II

The all new Native Power Pack II is an entirely different plug-in collection than the original Native Power Pack. Bass-enhancement, de-essing, vintage compression/expansion and EQ are all provided, and can be used with or without the original NPP. You can also upgrade from either NPP or NPPII to the Native Gold bundle for the complete Waves experience, and like the earlier NPP, the NPP II ***requires no extra DSP!***

ALSO AVAILABLE - THE NATIVE GOLD BUNDLE:
Includes all of the NPP I & II and Native Pro FX plug-ins. NPP I & II owners can even upgrade to the Native Gold bundle for the complete Waves experience, and like the earlier NPP, the NPP II ***requires no extra DSP!***

TC | WORKS
ULTIMATE SOFTWARE MACHINES

TC Native Reverb Plug-in For Mac or PC

From the company that brought you the Ultimate Sound Machines such as The Finalizer and M2000 wizard comes TC Native Reverb. A true TC-quality plug-in for DirectX and VST compatible applications. Packed with features in a familiar hardware style user interface. Rom presets include Catherdral, Church, Hall, Room.

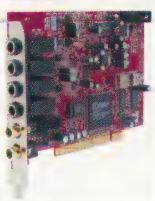
PARAMETERS–
- ROM Preset• Input, Output Level & Mix • Decay Time • Room Size • Room Shape• Diffusion • Color • PreDelay

SOUNDCARDS

The recent proliferation of computer based digital audio worksatations (DAWs) is enough to make even the most seasoned audio professional's head spin. Is it compatible with my software? How will it interface with my current gear? Does it have the I/O I need. How about expandability? B&H has the answers. We have a wide selection of the most popular digital audio cards and systems available to fit your budget and needs no matter how big or small.

Digital AUDIO LABS

Card Deluxe 24-bit/96kHz Audio Card

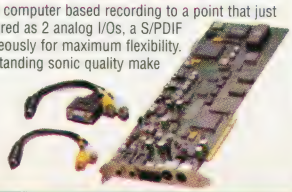


From the company that's been bringing sonic excellence to the Windows platform for nearly a decade comes the affordable Card Deluxe. It's a half length, no compromise, 24-bit/96kHz PCI card compatible with todays cutting edge production software. You can even chain multiple cards together for multiple sample accurate I/O's. Available now for Windows with support for the MacOS coming soon.

FEATURES–
- 8 to 24-bit resolution
- 22 to 96kHz sampling rate
- 2 channel 1/4" TRS balanced analog I/O
- Coaxial S/PDIF digital I/O • Full duplex
- +4/-10 balanced/unbalanced operation
- 4 channel operation using both analog and digital I/O
- Slave multiple Card Deluxes to single sample clock using DAL's WavSync drivers
- Windows 95, 98 and NT drivers
- DirectX support

KORG

12/12 I/O Multi-channel PCI Audio Card



The 1212I/O card helps bring the price of full function multi-channel computer based recording to a point that just about anyone can afford. It features 12 inputs and outputs configured as 2 analog I/Os, a S/PDIF I/O and and 8-channel ADAT optical I/O. All I/Os can be used simultaneously for maximum flexibility. Compatiblity with most Digital Audio Software on the market and outstanding sonic quality make the 1212I/O a great choice for project studios and multimedia pros.

FEATURES–
- Total of 12 ins & outs, all can be used simultaneously.
- 44.1 and 48kHz sample rates
- 20-bit enhanced dual bit Inputs, 18-bit outputs.
- 20-20kHz frequency response
- Compatible with any PCI Macintosh or Windows computer

digidesign AVID
A Division of Avid Technology, Inc

ToolBox PCI Digital Audio Bundle For Mac or PC

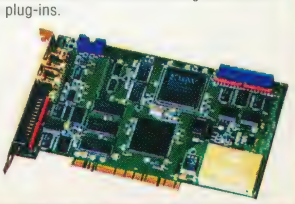
When you need professional features at an affordable price, the Digidesign ToolBox delivers a great combination of software and hardware for Mac or PC. Based around Digidesign's AudioMedia III a 16-bit audio card with stereo RCA inputs, 1 bit 128x over sampling A/D and 18-bit D/A converters as well as coaxial S/PDIF digital I/O. This system is ideal for personal and project studios, radio broadcast applications, and multimedia audio production.

ToolBox For Mac Includes:–
- Includes **Audiomedia III** card
- **Pro Tools 4.x** recording/editing software with playback support for up to 8 tracks of audio
- **D-fx** AudioSuite Plug-Ins (Reverb, Delay & Modulation Effects)
- **D-fi** AudioSuite sound degeneration Plug-Ins
- **Bias Peak Le** 2 track editing software

ToolBox For PC Includes:–
- Includes **Audiomedia III** card
- **Session** Software recording/editng w/ support for playback of 8 tracks of audio • **Logic Audio AV** MIDI sequencing/ audio software
- **Sound Forge XP** 2 track editing software • **ACID Rock** loop based audio sequencer allowing you to dictate the pitch and tempo of any .wav file

Soundscape

MIXTREME PCI Digital Audio Card



A flexible Windows based audio card built around a dual TDIF connector. Ideal for connecting to a digital mixer, DA88 compatible multitrack recorder or the SS8IO-2 or SS8IO-3 breakout interfaces available from soundscape. Includes Mixtreme V2 mixer software. The PCI card relies on its own DSP to handle mixing and effects which greatly reduces the latency associated with Native or DirectX plug-ins.

FEATURES–
- 16 channel, 24-bit digital I/O via 2, 8 channel TDIF (Tascam Digital Interface) Connectors
- Wordclock/Superclock In/Out (RCA connectors)
- Optional S/PDIF and Video Sync daughter boards
- Motorola 56301 DSP chip for mixing and effects
- ASIO and Multimedia Drivers for Windows 95/98 and NT4
- Multiple card support for up to 64 channels of I/O
- **OPTIONAL: SS8IO-2, ADAT to TDIF Converter and SS8IO-3, 20-bit Analog to TDIF converter**

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Digital Performer 2.6

MOTU

MOTU has already shipped their second major update of Digital Performer this year, with a relentless stream of new advanced features, like sample-accurate editing, sample-accurate sync and MOTU's innovative RAM-based loop recording tool called POLAR. Digital Performer is packed full of featues you won't find anywhere else:

FEATURES-

- Sample accurate waveform editing
- Includes over 50 real-time MIDI & audio effects plug-ins
- POLAR window - Interactive audio loop recording the way it should be
- 24-bit recording and editing
- 32-bit native effects processing - incredible sounding EQ and other FX
- 64-bit MasterWorks™ Limiter and Multiband Compressor plug-ins included
- Advanced waveform editor - it's like having a $400 stereo editor built-in!
- Sample-accurate - the most reliable editing and tightest sync you can get
- OMF export - transfer your entire session, crossfades and all, into Pro Tools
- Samplers window - drag & drop samples between your Mac and your Sampler!
- PureDSP™ stereo pitch-shifting and time-stretching
- Unlimited audio tracks, real-time editing, full automation and remote control
- QuickTime digital video support, and much more
- Compatible with Pro Tools|24, the MOTU 2408 and today's other popular systems
- Digital Performer is an entire recording studio inside your computer

2408 Hard Disk Recording System

The new Mark of the Unicorn 2408 is turning the industry upside down! No other system in it's price range gives you performance like this, with a full simultaneous 24 inputs and outputs on a custom designed VLSI chip that is dedicated to quality I/O. The 2408 is 24-bit compatible and you can link up to three units together for almost unlimited recording capabilities.

FEATURES–

- 7 banks of 8 channel I/O: 1 bank of analog, 3 banks of ADAT optical, 3 banks of Tascam TDIF, plus stereo S/PDIF.
- Custom VLSI chip for amazing I/O capabilities
- Connect up to three 2408 units to your computer for a total of 72 input and output connections.
- Format conversion between ADAT and DA-88
- 20-bit A/D and D/A converters on analog ins & outs
- 24-bit internal data bus for full 24-bit recording via digital inputs
- Standard S/PDIF I/O for digital plus an additional S/PDIF I/O for the main mix
- Sample-accurate synchronization with ADATs and DA88s via an ADAT SYNC IN and RS422
- Includes a complete waveform editing program for Power Macintosh.
- Will grow as your computer grows.

MIDI Time Piece™ AV 8x8 Mac/PC MIDI Interface

The MTP AV takes the world renowned MTP II and adds synchronization that you really need like video genlock, ADAT sync, and word clock sync, even Digidesign superclock!

FEATURES–

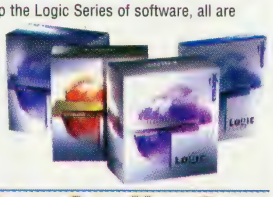
- Same unit works on both Mac & PC platforms.
- 8x8 MIDI merge matrix, 128 MIDI channels.
- Fully programmable from the front panel.
- 128 scene, battery-backed memory.
- Fast 1x mode for high-speed MIDI data transfer.

Digital Time Piece™ Digital Sync Interface

Think of it as the digital synchronization hub for your recording studio. The Digital Timepiece provides stable, centralized sync for most analog, digital audio, and video equipment. Lock together ADATs, DA-88's, ProTools, word clock, S/PDIF, video, SMPTE, and MMC computers and devices flawlessly. It ships with "Clockworks" software which gives you access to its many advanced features and remote control of some equipment settings such as record arm.

emagic Logic Series Software
MIDI/AUDIO/NOTATION software for Mac/PC

Below is a brief description of the three basic programs that make up the Logic Series of software, all are available for either Mac and Windows operating systems.

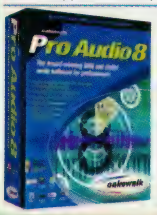


LOGIC AUDIO SILVER Powerful Midi, provides up to 24 tracks of digital audio and built-in realtime DSP effects

LOGIC AUDIO GOLD offers more editing options with Event, Hyper, Score, Matrix, Arrange, and Emagic's revolutionary environment. With up to 48 audio tracks you have enough power to get serious.

LOGIC AUDIO PLATINUM Provides the entire combined feature set of the rest of the Logic series, 16 and 24-bit capable and simultaneous support of multiple third party hardware.

cakewalk Pro Audio 8
MIDI/Audio Software for PC



One of the industries leading MIDI/Audio software with a wide range of hardware support and realtime automation and editing for. Windows 95/98 and NT 4.0.

Features–

- 24-bit/96kHz compatible
- 128 audio tracks, 256 Audio/MIDI tracks
- 256 realtime effects w/ 32-bit processing
- Vector based volume/Pan automation
- MIDI effects- quantize, delay/echo, transpose, arpeggiator
- 24 stave notation w/lyrics, chord symbols, guitar chord diagrams and percussion notaion
- SMPTE, MTC and MMC support
- Playback of .AVI, QT and MPEG video

Steinberg

CUBASE VST Virtual Studio Technology

Steinberg's Virtual Studio Technology (VST) turns your PowerPC or Windows based computer into a music production powerhouse featuring digital audio, real-time effects, automation, MIDI and scoring in one single program. Expandable with software Plug-Ins and an audio bus system for use with the latest generation of multi I/O audio cards, Cubase VST delivers.

FEATURES–

- Up to 64 channels of digital audio
- Complete mixer with up to 4 EQ's per channel
- 4 inserts effects & 8 aux sends per channel
- All Realtime, Every action can be automated

- ***CUBASE SCORE*** adds professional score printing and layout functions
- ***CUBASE VST/24*** adds support of 96 audio tracks 24-bit/96kHz audio

PRODUCER PAC/24 For Mac Or PC

All the software you need to go from composition to CD. Based around Steinberg's cutting edge MIDI/AUDIO software Cubase VST/24 which supports 24-bit/96kHZ audio files and upto 96 audio tracks. Support for all of the most popular audio cards and computer based workstations means that you can work with the hardware that's right for you.

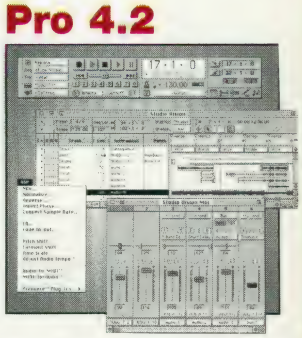
FEATURES–

- **Cubase VST/24**
- **Wavelab (PC Only)-** 2 track editor supports upto 24-bit/96kHz audio files, DirectX and VST plud-ins allows you to create Red Book Compatible CD's
- **Prosoniq Sonic Worx Essentials (MAC Only)-** 2 track editing software supports 24-bit/96kHz files and real time VST plug-ins
- **Adaptec JAM (MAC Only)-** Red Book compatible CDR software
- **Waves Renaissance Compressor-** Opto & Electro emulation modes, Brickwall limiting, Warm character setting, Auto release
- **Spectral Design's FreeFilter-** 30 band linear phase filter, Spectral analysis, Learn & Morph modes imposes "Finger Print" of one audio source on another

OPCODE

Studio Vision Pro 4.2

The newest version of this studio classic, Studio Vision Pro 4.2 incorporates many new features for the studio professional. Including enhanced 24-bit support for ProTools compatibility and a new MIDI event editor, you should see for yourself what's new at Opcode, the boys have been working overtime.



FEATURES-

- NEW look graphic interface makes it a pleasure to be working in front of the computer for hours (and hours, and hours)
- All functions are completely user definable through command keys/MIDI keys
- 24-bit support in DSP and playback means you have complete compatibility with the ProTools 24-bit system
- Stereo file support includes DSP processing
- Extensive NEW crossfade menus, vertical scaling of Waveforms and Strip Chart
- Ability to sidechain DSP plug-ins
- Non-destructive real=time Groove/Grid quantize
- Nudge events in both time and pitch
- Continuous controller oscillating tools
- Extensive new DSP preferences
- NEW pulse edit window
- NEW built-in arpeggiator uses quantize filters and records in perfect sync to your tempo map, runs entirely independent or your sequencer playing or recording
- Import and Export Quicktime 3.0 files.
- Much, much more...

Vision DSP Digital Recording Studio

Vision DSP provides support for Steinberg's industry-standard VST audio plug-in architecture, bringing extensive real-time effects to the Opcode product line. A vast array of user-interface enhancements make Vision DSP the most highly intuitive, visually responsive music production software available.

NEW FEATURES–

- VST Plug-in support
- Up to 16 buses for creating sub-mixes.
- Built-in 4-band EQ
- Pulse edit window & New MIDI arpeggiator.
- Expoanded routing capabilities
- Extensive Audio hardware support.

Studio 64XTC Cross Platform Interface

The Studio 64XTC takes the assorted, individual pieces of your studio-your computer, MIDI devices, digital and analog multitracks and even pro video decks, and puts them all in sync.

KEY INFO #84

FEATURES–

- 4 In / 4 Out, 64 channel MIDI/SMPTE interface/patch-bay with powerful multitrack & video sync features
- ADAT sync with MIDI machine control
- Cross-platform Mac and Windows compatibility
- Simultaneous wordclock and Superclock output, 44.1kHz or 48kHz for perfect sync with ADAT, DA-88 and ProTools
- Video and Blackburst in (NTSC and PAL)

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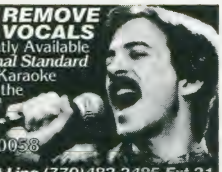

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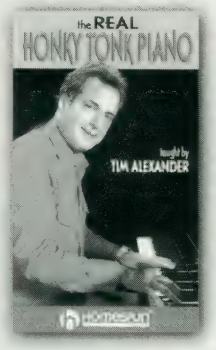

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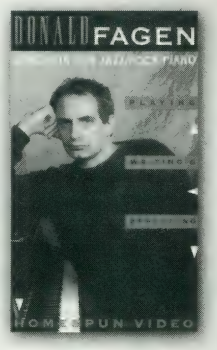

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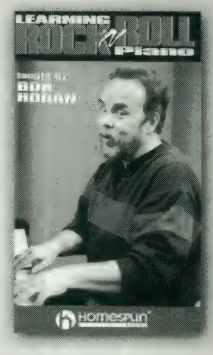

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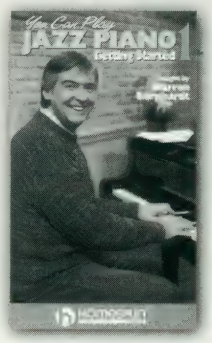

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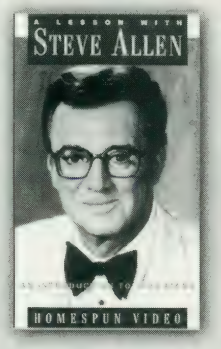

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workspace

You're looking at the bedroom studio of one **Rob Hoffman**: producer, synthesist, songwriter, all-around superstar kind of guy in the L.A. scene. Rob was featured in our Nov. '95 issue for his work on Michael Jackson's *HIStory* CD, but that's just one of many projects that Rob has Hoffmanized. Most recently, he co-wrote, produced, and recorded the power ballad "Obvious" on teen diva Christina Aguilera's platinum debut.

About the studio, Rob explains that "up until this summer the whole studio was built into roadcases. During my Michael Jackson days I moved around a lot and the whole rig went with me. Everything was wired with Mogami [cable], and each rack came to a central patchbay. All the synths were normalled to Mackie 3204 line mixers for monitoring. When tracking, I took them right off the patchbay to Neve mic preamps, then to tape. During the Christina project I made the decision to move the studio to the permanent racks you see in the picture. All the wiring, Elcos [connectors], and patchbays stayed, and the roadcases were retired. I'm using ASC tube traps to smooth out the room. They make a big difference, especially in my little vocal booth."

Rob is an equal-opportunity synth lover, but does he favor one over the others? "Every synth has its own character," he says, "but I still can't get away from the Minimoog. I'll try to keep it off for a while, but then I'll come back to it when no other bass will work. It continues to be the most useful piece of gear I own. Basses, leads, running loops through the filter — it does it all. I'll even use it to multitrack pads and brass type stuff, a trick I learned from Steve Porcaro." Another dust-free ax is the Clavia Nord Lead. "It basically shows up on every track we write. Great for sweeps and wild, fruity effects. It really cuts." He also relies on the analog Jomox X-Base 09 for drum programming. "It's deep, but still easy to use. Very different from the other 808/909 copies. It's an inspiring box."

Rob's recorder of choice is Digidesign Pro Tools. "Pro Tools became a necessity. In Los Angeles it's pretty rare to do a record without Pro Tools being involved at some point. I tried a couple other systems, but in the end I went with Digi." And while many PT users are content to mix on the computer screen, Rob favors hardware. "The Mackie D8B is amazing. I waited and watched the Internet newsgroups for about a year before I bought the console. It sounds great and is easy to use. I had to abandon some of the conventions I'd gotten used to using on analog desks, but after I figured out my own methods, everything was smooth. Many of projects I've done on it have received high praise from mastering engineers and clients."

When it comes to effects, Rob has plenty of software and hardware choices at hand. But there's one set of tools he's particularly jazzed about. "I'm loving these new Electrix boxes. They are literally changing the way I approach writing, tracking, and mixing. They just sound great! Everything syncs and is transmitted via MIDI. Super-easy to use."

What advice does Rob have for home studio owners? "Organization is the key. It drives me crazy when I go to other studios that have great gear, but they skimped on the wiring or patchbays. As an assistant in New York, I watched a lot of different session players come in, and I always checked out how their rigs were wired. When it came to wiring my rig, I took the best of their ideas and fused them together. Everything comes up in the patchbay, and I use Mogami and some Monster cable for everything. It's not cheap to get good cable, but productivity soars when there are no technical problems. At any given time I could be working on four or five projects. Just a few months ago we were in the middle of production on over 20 songs. You can't switch between projects like that without being organized."

To hear what Rob has done in this room, pick up a copy of the aforementioned Christina Aguilera CD, as well as the latest from Michelle Crispin on Rob's own Lovegroove record label. For a blow-by-blow list of Rob's studio contents, point your Web browser at www.keyboardonline.com. GREG RULE

Do you have a home studio or keyboard/recording rig that deserves our spotlight? Send photos and info to Greg Rule c/o *Keyboard*, 411 Borel Ave., Ste. 100, San Mateo, CA 94402, or email to gregrule@mfi.com.

Photos by Tom David Stratton

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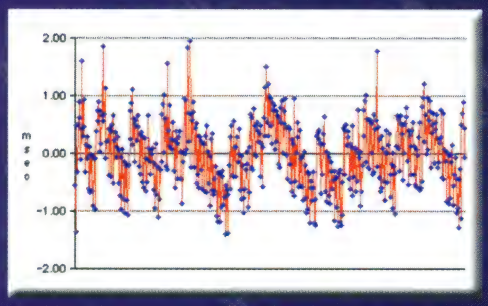

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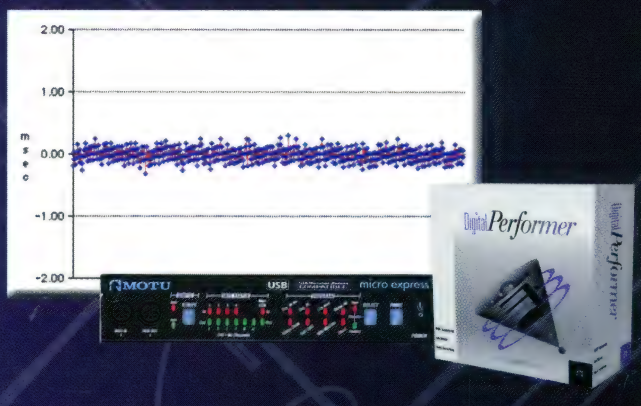

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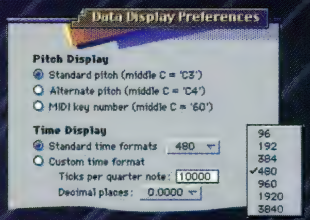

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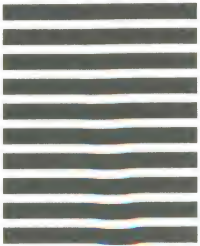

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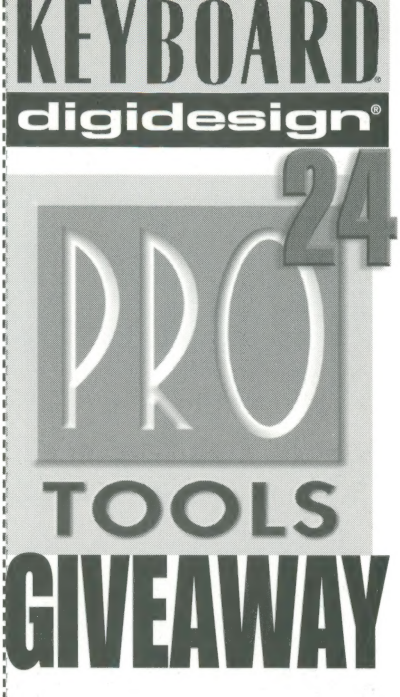

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